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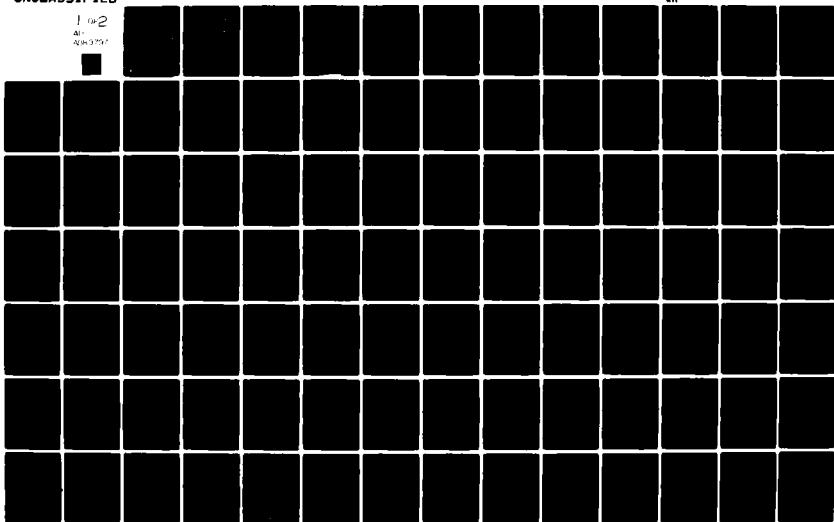
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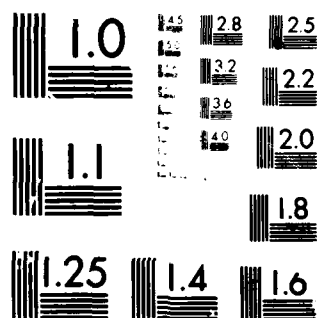
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FINANCIAL ACCOUNTING AND REPORTING IMPROVEMENT CONCEPTS

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FEBRUARY 1980

FINAL REPORT

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) Significant improvements are needed in order for the Navy's financial systems to satisfy internal needs and requirements of the GAO and OSD. Existing and planned financial projects may not provide the needed improvements within an acceptable time period. The most significant of the needed improvements are the reporting of full costs by program and organization and capitalizing and depreciating property. Correcting these		

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20. Continued - deficiencies will be a multi-million dollar effort that will take several years to complete.

Before adopting a final plan of action to correct the deficiencies, the Navy should undertake further research to define, in greater detail, cost and property accounting policies that will satisfy its needs and the GAO/OSD requirements in a practical manner. The Navy should also develop a conceptual design of a standard system for implementing those policies in its financial network.

A standard financial system developed and maintained through a central systems organization will probably be needed in order to provide reliable financial information on a timely basis and at a reasonable cost. The standard system would perform accounting and reporting for reporting elements that would use a uniform general ledger and follow uniform accounting principles.

[illegible]

February 29, 1980

Dear Sirs:

RE: CONTRACT NO. 0014-79-C-0872

We are pleased to present the final report of the findings of our research on the financial accounting and reporting concepts we recommend for systems for the Navy.

In performing the research, we worked closely with personnel of the Office of the Comptroller of the Navy (NAVCOMPT) and met with Navy and contractor personnel involved in planning, programming and budgeting, ADP systems and existing financial improvement projects to obtain an appreciation of the Navy's financial information needs and plans. We also visited several Navy field accounting activities and examined a number of existing accounting and reporting systems to better understand the status of those systems. We reviewed external compliance and reporting directives and

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met with officials of the General Accounting Office (GAO), Office of the Secretary of Defense (OSD), Department of Treasury, and Office of Management and Budget (OMB) to assess those requirements. Finally, we met with officials of Air Force and reviewed reports of a recent study of accounting and reporting systems in the Army to determine the direction of the other services in meeting compliance requirements.

We found that many of the Navy's financial accounting and reporting systems do not conform to requirements of GAO and OSD. Consequently, many of the Navy's systems have not been approved by the GAO, as required by law. Our work focused on the Navy's internal financial information needs, as well as GAO and OSD requirements, to assess whether the implementation of the requirements is likely to result in financial information that would be useful to the Navy.

Summary of Principal Findings

Our research disclosed a number of problems with existing financial management systems which can be categorized into three general groupings.

1. The Navy's Current Systems Do Not Satisfy Internal Navy Needs.

Most existing official Navy accounting systems report information about fund status. This fund

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status information often reaches management, particularly at departmental levels, too late to be useful and is sometimes inaccurate. Consequently, reliance frequently is placed on unofficial systems and memorandum records for essential financial information that cannot be obtained accurately or on a timely basis from official systems. This results in duplication of accounting functions and reporting. It also results in the danger that key decisions may be made on information supplied by systems that have not been reviewed for adequacy of controls that insure reliable reporting.

Further, there are substantial needs for financial information other than fund status, including total program costs, status of amounts due from the public and others and performance measurement data. For the most part, this information is not available through official accounting systems. Other systems that may provide the information generally have been designed for special purposes and are not integrated with the official accounting systems.

2. The Navy's Current Systems Do Not Satisfy Externally Imposed Requirements.

GAO and OSD require that official accounting systems:

- employ the accrual basis of accounting.
- be able to report costs in the program and organization for which they are incurred.
- record inventory and property information in the general ledger.
- be capable of calculating and reporting depreciation.

These requirements are additive to the appropriation and fund accounting capabilities of existing accounting systems. The Navy has taken steps to improve its financial systems to meet the additional

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requirements and have them approved by the GAO, as required by law. However, many of the efforts that would achieve compliance are not planned to be completed until 1990.

3. Existing and Planned Financial Projects May Not Satisfy the Navy's Internal Needs or Externally Imposed Requirements.

The financial improvement projects planned or underway within the Financial Management Improvement Program (FMIP) and elsewhere in the Navy, are not adequately coordinated. As a result, there may be unnecessary duplication, and inefficient phasing of individual projects. For example:

- The Naval Education and Training Financial Management System (NETFMS) at Pensacola was originally designed for IBM computer hardware, but was changed to UNIVAC hardware before the system was implemented. Had the NETFMS project team been aware of the planned change in computer equipment, the system could have originally been designed for the UNIVAC equipment. This would have avoided the costs of redesigning the system from IBM to the UNIVAC equipment.
- The Integrated Disbursing and Accounting (IDA) project is designed to consolidate the Navy's disbursing and accounting functions in a network of 16 Financial Information Processing Centers (FIPCs). The FIPCs are to be linked to activities they support, to other FIPCs, and to a Central Accounting and Finance Office (CAFO) through a teleprocessing network. A recent modification to the IDA project calls for the implementation of the NETFMS system at 11 or 12 FIPCs within two years. That system will probably be operated on mini-computers and might ultimately be installed at all FIPCs. The NETFMS system is expected to perform disbursing and accounting functions performed by present systems. However, since

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the Navy has not determined how it will implement the GAO and OSD requirements, the NETFMS system is not expected to meet those requirements in its present form.

Summary of Conclusions

The Navy must improve its accounting systems to provide better information for Navy management at all levels. Also, the GAO/OSD requirements will necessitate fundamental changes in the Navy's accounting and financial processing systems, particularly those at the FIPCs. It will probably take several years to develop accounting and processing systems that implement the changes. We believe the most significant of the changes required are the reporting of costs by program and organization, and capitalizing and depreciating property. These will require uniform accounting treatment of transactions across appropriations and transfer financial information among accounting systems.

We believe that additional research is desirable prior to approval of a final plan of action to correct the deficiencies. This will insure maximum effect for the substantial resources the Navy has already programmed to modernize its accounting systems. It will also help achieve modern, labor-saving, computerized accounting systems that

meet the Navy's internal financial management needs as well as GAO/OSD requirements.

Summary of Recommendations

The FMIP should be strengthened so that it can provide effective central coordination and planning for all Financial Management Improvement projects.

The Navy should develop a conceptual design of the ultimate, standard FIPC/CAFO system. This will help assure that the interim IDA approach (NETFMS) is compatible with the longer range effort to develop and install the standard Navy accounting and financial processing system.

Before the conceptual design can be completed, however, the Navy should define its financial information needs, particularly for cost and property information. We recommend the following research projects for that purpose.

- Cost Accounting

The Navy should research accounting policies and guidelines that conform to GAO and OSD requirements and a structure of accounting entities that will satisfy the Navy's financial information needs. The research would determine the levels at which general ledgers and data bases should be maintained and would develop preliminary concepts for summarizing, reporting and transferring information among systems and organizations. The products of

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the research would be a preliminary revision of the Navy's Accounting Principles and Standards and a description of the recommended structure of accounting entities. Those products would provide the basis for studying alternative approaches to processing systems.

- Property Accounting

The Navy should research existing property systems to determine a suitable basis for a Navy-wide property system. The Navy-wide system would be integrated with other financial systems and be capable of calculating and reporting depreciation. The product of the review would be a conceptual design of the system and an approximation of development and installation effort.

The preliminary conclusions of the Cost Accounting and Property Accounting research efforts should be the basis for work on the conceptual design of the ultimate, standard FIPC/CAFO system. Alternative approaches to effective and economical systems development, maintenance and operation would be studied. The study effort supporting the design would focus on the relative effectiveness and economy of accommodating present and future needs in existing systems or in new systems that would replace existing systems. The products of the study effort would be the conceptual design of the selected systems approach and a plan for the design and implementation of that approach.

The preliminary conclusions of the research efforts upon which the design study will be based would be reevaluated

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in light of the alternative systems approaches, revised if necessary and coordinated with OSD and the GAO. The Navy would then revise its accounting manuals and instructions to conform to the accounting standards developed in the research projects, with the assurance that they will be acceptable to the GAO and OSD.

At that point, the Navy will have the conceptual design of the ultimate, standard FIPC/CAFO system and the accounting requirements of other financial systems. The other systems would then be reviewed for conformance with the design, after which a long-range plan for improving and integrating all financial systems would be completed. That plan would eliminate the need for financial improvement projects outside the FMIP.

Estimated Cost of Recommended Efforts

We estimate that the accounting research and conceptual design study efforts described above can be completed in an elapsed time of 9 to 12 months at a total cost of approximately \$500,000. Our estimate of the cost of the individual projects that are needed is as follows:

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Cost accounting research	\$100,000
Property accounting research	65,000
Conceptual design study	335,000

	\$500,000
	=====

We believe that these efforts will result in the Navy having the information it needs to make the multimillion dollar decisions on financial and accounting system improvements that are required.

The research, design and installation of the standard FIPC/CAFO system and completion of the FMIP projects that would be incorporated in that system may be a four to seven year effort, depending on the approach adopted, specific system requirements and the extent of interface within the financial network that is necessary. We are not able to provide a reliable estimate of the cost of the effort until the conceptual design study is completed. However, we have made an overall approximation of the costs of completing the present FMIP based on the estimated cost of the FMIP as set forth in the FY 1981 Program Objectives Memorandum (POM) and informal discussions with Navy personnel. It appears that about \$100 million may be spent over the next ten years to complete the present FMIP. Accelerating the development of a standard financial system within a long-range plan should

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make it possible to achieve the improvements at lower cost and in less time than ten years.

We appreciate this opportunity to assist the Navy and the courtesy and cooperation that we received during this project. We would be happy to discuss the project and our findings and recommendations with you, at your convenience.

Very truly yours,

Arthur Andersen & Co.

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FINANCIAL ACCOUNTING AND REPORTING
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I. NEEDS

I. FINANCIAL ACCOUNTING AND REPORTING ENVIRONMENT AND PROBLEMS

The Navy provides air, land, surface and subsurface forces that are ready for deployment throughout the world. That requires many types of resources and involves a number of activities, including maintenance, training, health services, transportation, and housing. The Navy operates in a dynamic environment with long- and short-range programs developed to meet changing threats. Efficient and economical use of scarce Navy resources is essential and programs must be planned to ensure that resources will be available to meet future, as well as current mission needs.

Navy managers need accurate and timely information in order to plan, program, budget and execute programs. This information is obtained from a number of operating systems (management information systems) and financial systems that are largely decentralized and that are of varying reliability and sophistication. Our research has been concentrated on financial systems. However, since much of the information obtained through financial systems is closely related to information in operating systems, reviews of particular financial or operating systems should consider other systems that may provide comparable or duplicative information. Unfortunately, the decentralized approach to systems development used by the Navy has often encouraged the view that

each system is independent, resulting in duplication of systems and information. In addition, this approach typically does not provide for systems that should be integrated to communicate with each other.

There are a number of internal needs and external requirements that are not provided for in existing financial systems. Our research disclosed that most of those needs and requirements have been recognized for some time and that plans have been developed, principally through the Financial Management Improvement Program (FMIP), to undertake projects to provide for them. In the following paragraphs, we describe the principal problems with Navy's financial information systems. In later sections of this report, we describe the principal projects planned by Navy to satisfy its financial information needs and ways in which these projects might be addressed to better ensure their effectiveness and to minimize their cost.

Problems with Existing Financial Information Systems

Our research disclosed a number of problems with existing official financial information systems, which we have summarized into five areas - timeliness, accuracy and completeness, reliability and control, technology, and cost.

1. Financial Information is Often Obtained Too Late to be Useful.

Obligation and expenditure information, the most widely used output of financial systems, sometimes reaches departmental managers two or more months after the transactions have occurred. This is often too late to be useful, since management decisions must be made on the basis of funds available at the time an obligation or expenditure is being considered. Processing and reporting delays result principally from separation between disbursing and accounting activities, processing backlogs and outdated reporting techniques.

2. Information is Often Incomplete and May Not Be Accurate.

Financial information is processed at a number of locations, using a variety of accounting and information processing systems. Obligations or expenditures that occur on the same day may be reported in different periods, depending on the backlog and processing time at the particular locations at which they are processed. Internal control techniques may vary depending on the available resources and prescribed controls at a particular location and the controls incorporated in the particular computer processing system used. Accounting systems that have been developed for specific appropriations and funds employ different coding structures and are based on different accounting principles that are sometimes inconsistent even within a particular system. For example, special procedures are used to provide field managers with information about military personnel costs, but not about the costs of other "free" resources.

The Navy uses extremely complex structures for coding financial transactions that make it difficult for some individuals to accurately code each transaction. Many processing systems lack sophisticated techniques for detecting coding errors, resulting in significant risk that errors may flow through to reports. Although a project to simplify the coding structures has been undertaken, the resulting recommendations have not been implemented and may not address all current coding needs.

Most internal control techniques are directed toward the recording of transactions affecting

fund status. Techniques for substantiating and verifying other financial information are less widely used. For example, military personnel cost information provided to field operating managers is not reconciled with actual military personnel cost information from military pay systems. While physical counts are made to verify recorded information about units and location of inventories and property, the related cost information is often not verified. Checks to assure that transactions are recorded consistently in official accounting systems and in other systems are not always made. The limited use of these techniques may be due to a number of factors including:

- The volume of transactions involved.
- The financial information involved is less sensitive than fund status information.
- Records of physical assets are maintained at different locations than the physical assets themselves.
- Integration between operating and financial systems is limited.
- Magnitude of errors in recording transactions makes reconciliation burdensome and costly.

3. Financial Information Obtained Outside Official Accounting Systems may not be Reliable or Controlled.

Financial information obtained from official systems is generally limited to fund status information that is often provided too late to be useful. As a result, most managers have turned to other sources for financial information. The other sources range from automated systems to manually prepared memorandum records. However, they are similar in that they were developed principally to satisfy the local needs of particular managers. As a result, the definitions and principles governing the classification and reporting of information through those systems may be different, and many "systems" may not have been reviewed for adequacy of controls that ensure reliable processing and reporting.

Departmental and other personnel outside the particular command or activity operating a system cannot be certain that the information obtained from the system is reliable or, in fact, is the

information that they seek. Most of the departmental personnel we interviewed have identified specific financial information sources outside the accounting records. They tend to accept information provided by those sources although the same item of information may be defined and provided differently by different sources or systems. For example, information from "VAMOSC" systems is used in planning and programming although the various systems that provide input to VAMOSC have not been evaluated as to reliability or consistency and the VAMOSC system itself is still being validated.

In addition to problems of reliability and uniformity, it is expensive to maintain local accounting systems that duplicate information that could be obtained less expensively from official accounting systems. Although it is not practicable to estimate the costs that result from this duplication, they are clearly substantial.

4. Numerous Financial Systems are Technologically Obsolete.

Many existing financial information systems are successors to systems that were originally manual, then converted to unit record equipment, then finally converted to later model computer hardware that is now in use. Substantial amounts have been spent on computer hardware that is capable of on-line processing, performing validation and reasonableness checks, and rapid random access of information; however, the software employed, which is often still based upon software designed at a time when computer hardware did not have such capabilities, often does not provide for using the more sophisticated features of the modern computer hardware. For example, we noted a situation where six separate passes are made through a sequential tape file for update purposes when all updates could be programmed to be performed through one pass or where disk files, rather than tape files, would permit selective access for updating.

Failing to fully use the capabilities of modern ADP equipment not only reduces controls over financial accounting, but, as in the example just cited, contributes to processing backlogs and can be expensive.

5. Decentralized System Design and Operation is Expensive.

Systems are developed separately through a number of central design agents (CDA) to be operated on different types of computer hardware. Basic system designs that are specified by local managers are likely to be different. With decentralization of CDAs, detailed system structures are also likely to be different. Therefore, a uniform departmental requirement, such as a particular classification structure, may be implemented differently at different locations, even where the locations use the same hardware.

The multiplicity of system design results in expensive duplication of efforts and can result in the same requirement being interpreted and implemented differently by different CDAs in different systems. It also dilutes the systems design and installation talent of the Navy. The many CDAs are parallel organizations with broad scopes of activities that might be performed more effectively through one CDA organization made up of individual groups with specific functional expertise. In a recent report on the Navy's management information systems, the GAO criticized the Navy's decentralized approach to systems development, citing many of these same problems.

External Financial Reporting Requirements

There are a number of external requirements with which Navy's financial systems are expected to comply. These requirements have increased substantially in recent months and years, putting Navy further behind in its compliance efforts. Navy accounting systems must, by law, be reviewed and approved by the General Accounting Office (GAO). The Secretary of Defense and the Secretary of the Navy have made specific commitments to GAO to the effect that all-out efforts will be made to have all accounting systems approved.

The history of external reporting requirements that have not been incorporated in Navy's accounting systems is documented extensively. We have summarized below six overall requirements that appear to be significant to future Navy accounting, particularly in view of systems projects planned under the financial management improvement program.

1. Public Law 84-863 has, for more than 25 years, required that Federal agencies maintain their records on the accrual basis of accounting in support of cost-based budgeting. Over the past 15 years, the Department of Defense (DOD), including Navy, has undertaken numerous projects intended to implement accrual accounting, but with only limited success. Success has been limited by the multiplicity of systems and decentralized systems approach discussed previously, the separation of disbursing and accounting functions, and the numerous accounting systems that have been designed along appropriation lines to meet specific classification or other needs and requirements. Failure to properly implement accrual accounting may not have created overwhelming problems in the past, probably because appropriation committees of the Congress have not appeared to be interested in accrual information or cost-based budgets. However, the use of historical cost information by the Navy is increasing and accrual accounting is essential to determine cost information properly. Therefore, GAO and OSD requirements are only one reason that Navy should implement uniform accrual accounting with official, controlled systems. The second, more compelling reason, is to meet Navy's own needs for timely and accurate cost information.
2. The Department of Treasury and GAO have been working for several years to develop reliable consolidated financial information for the U.S. Government. This information includes property and fixed assets, accounts receivable from others, amounts due to others, and is to be prepared on the accrual basis. Consolidated reporting is in a prototype stage, largely because many agency accounting systems, including those of the Navy, are incapable of providing reliable information for consolidated reporting.

3. Title 2 of the GAO Policy and Procedures Manual for Guidance of Federal Agencies sets forth principles to be employed in the accounting systems of all agencies. These requirements, which are discussed in greater detail in Appendices 1, 2 and 3 of this report, require accrual accounting, cost accounting, reliable records of investment in property and the capability to calculate and report depreciation of fixed assets. Navy accounting systems must meet the requirements of Title 2 in order to be approved. Of some 54 Navy systems, only 30 (principally payroll and industrial fund) have been approved by GAO. The others do not meet GAO requirements for reasons that are documented in Appendix 1.

GAO is presently involved in a conceptual study of Federal government accounting. This effort will probably result in new requirements, particularly for cost accounting and valuation of assets and liabilities. The Navy's problems in meeting present requirements with existing systems are likely to be compounded by the additional requirements.

4. DOD cost and property accounting policies were revised during 1979 and are now consistent with the requirements of GAO. This, together with the commitment of the Secretaries of Defense and Navy to obtain approvals of accounting systems, are significant developments. It means that the Office of the Secretary of Defense will expect Navy, Army and Air Force to obtain systems approval.
5. A uniform general ledger account structure that is to be used by all defense agencies is being developed by a DOD task force. Since Navy will probably be required to use this structure, it must ensure that the structure provides for Navy's information needs and can, therefore, be an effective part of the basic structure of its financial information systems. Since design of this structure is well under way (the assets, liability and capital accounts have been designed and circulated for comment), Navy must move quickly to document its financial information needs and to ensure that these needs are accommodated in the uniform structure.
6. There is, at present, increasing emphasis on cash management, outlay reporting, and collection of amounts due from others. There is also the need to deal with the latest requirements of zero-base

budgeting and increasing budget pressure and information requirements from Congress. Our discussions with OSD, GAO, OMB and Treasury indicate that pressures for sound financial reporting and changes in financial information requirements are likely to increase during the 1980's. We have described above GAO's current efforts on the concepts of Federal government accounting and reporting. Emphasis on outlay estimating and collection of receivables is likely to continue to increase and Treasury is considering several other actions, including possible changes in the handling of uncleared checks, that could be very significant for Navy during the next decade.

If we consider the Navy's difficulties in meeting its current needs through its official accounting system and in obtaining GAO approval of existing systems, the problems associated with accommodating future changes are quite clear. Because systems cannot communicate with each other, meeting internal or external special requirements is often a laborious manual process.

11. EXISTING
PROJECTS

II. PROJECTS AFFECTING FINANCIAL REPORTING AND ACCOUNTING

The Navy initiated the Financial Management Improvement Program (FMIP) "to assess the need for long-term improvements to financial management systems and to exploit those improvement opportunities that have the greatest potential for cost savings." A number of FMIP projects are underway and others have been broadly defined but not yet initiated. The projects are described in Appendix 5 to this report.

The Naval Data Automation Command (NAVDAC) has obtained \$150 million of contractual authority for converting selected computer hardware to UNIVAC equipment, part of which is funded through the FMIP. Many of the hardware configurations supporting existing financial management systems will be affected by these conversions.

The Department of Defense (DOD) is developing a new uniform chart of accounts which Navy will eventually be required to implement.

There also appear to be a number of financial information projects under way at individual activities or commands, such as VAMOSC (NAVSEA and NAVAIR) and an applied cost project at Patuxent Naval Air Station.

At present, responsibility for each FMIP project is assigned to a project team and these teams are expected to communicate and coordinate with each other. In fact, it appears that coordination among project teams is limited, and, sometimes, there may be inadequate coordination between the headquarters and field participants in any one project team. This is demonstrated in the IDA project, where central reporting requirements have not been provided to developmental people in the field, where the substantial changes that may result from project 77-2 have not been communicated to the field, and where project personnel have been unaware of planned computer hardware changes. We believe the FMIP should be strengthened in order to improve the efficiency and effectiveness of financial management improvement projects.

There is also a need for coordination with the FMIP of financial information projects undertaken outside the FMIP. We are aware of several requests for significant contractor assistance that have been issued during the past three to four months, all of which address field level accounting systems, and that at least two more such requests are being considered.

Finally, Navy needs to consider rephasing existing and planned financial information projects, particularly those under the FMIP. The current phasing of these projects

was developed largely on the basis of a 1974 study of Navy's financial information needs. Since then, there have been a number of developments that affect financial information needs, the more significant of which are discussed in the first section of this report. These include the increasing needs of planners and programmers for reliable cost information, increased emphasis by GAO and OSD on cost and property accounting, increased involvement in and emphasis on efficient spending by Congress and the many changes in requirements that are anticipated in the coming years.

While we believe that better coordination and better phasing of existing projects should be undertaken, we do not believe that existing efforts should be curtailed, at least until a plan to rephase the FMIP is complete. This is particularly true of the IDA project because disbursing and accounting functions must be combined and linked in order for the Navy to have a basis for systems improvement. Interrupting existing projects might result in loss of momentum and loss of resources that might not be recovered. Accordingly, rephasing and coordination of projects through the FMIP should be addressed immediately in order for improvements in coordination, and resulting savings, to be accelerated.

In the remainder of this section, we present several specific observations that, together with changes in

Navy's overall financial environment, point to the need for reviewing the present phasing of the planned projects in light of today's financial information needs and requirements.

- GAO Compliance Project

A new FMIP project has been proposed by NAVCOMPT to obtain GAO approval of Navy accounting systems. As proposed, this project would address four principal areas - accrual accounting, applied costing, integration of property and other financial accounting, and calculating and reporting depreciation - and would coordinate Navy's involvement in the uniform general ledger structure being developed by the Department of Defense. The thrust of this project would be to modify Navy accounting to provide for cost accounting that would be uniform, irrespective of the appropriations through which resources are funded, that would have the capability to include depreciation as part of cost, that would expand property systems to cover all Navy property, including military property, and that would integrate property systems with other financial systems. This project clearly would have a significant impact on all Navy accounting systems and on a number of other proposed projects, including project 77-2, whose proposed coding structure might have to be modified to accommodate cost and property accounting requirements.

- DOD General Ledger

At this time, the portion of the DOD-wide general ledger that would be used for cost accounting and reporting has not yet been established. Also, there is a separate DOD project dealing with property classification that could affect the inventory and fixed asset accounts that have been proposed for inclusion in the uniform general ledger. As explained previously, this general ledger structure, if implemented, should serve as part of the basic Navy accounting and reporting structure. The Navy must play a key role in the development of the DOD uniform structure in order for it to be effective for internal needs. However, the internal compliance project that is to resolve basic accounting issues relating to Navy's internal needs for financial information and

coordinate Navy's involvement in development of the uniform structure is not yet active. Thus, there is a significant risk that the uniform structure will be completed before Navy can effectively influence the project to ensure that its needs are satisfied.

- Project 77-2

Project 77-2, which attempts to simplify the accounting coding structure, has developed alternative recommendations for new structures that are presently under consideration. However, these proposed structures have been developed in the existing environment to accommodate existing coding requirements. As a result of our review, it appears that the coding requirements associated with uniform cost accounting and full implementation of property accounting have not been considered in the proposed structures. However, the proposed structures are simpler than existing structures and may allow sufficient flexibility to accommodate cost and property account codes.

Some of the classification needs that are presently provided for through the proposed coding structures might better be accommodated in processing systems themselves and in the uniform general ledger structure and subsidiary accounts. This would permit further simplification of coding structures. The greatest opportunity for this simplification probably lies in standard financial systems of modern design. The key point is that Project 77-2 provides for the coding structure to be the principal means of accommodating the multiple classifications of transactions that are necessary. Given the diversity in accounting and processing systems, this may be the only way in which Navy's classification needs can be handled in the present environment. However, it results in error-prone coding structures because of their length and complexity. To the extent that structures could be simplified by providing classification needs through uniform systems and general ledger account structures, the likelihood of error would be reduced.

Changing the basic coding structure would have a profound impact on existing financial systems, which would have to be reprogrammed to accommodate different fields and codes. It may be preferable to defer a final decision on Project 77-2 until

the Navy has a better picture of its financial information needs and the accounting and processing system structures that can best meet those needs. This would reduce the chance that extensive programming changes would have to be repeated.

- IDA Project

The IDA project is perhaps the most significant single financial improvement project undertaken by Navy in recent times. In addition to substantial reorganization of accounting and disbursing functions, IDA involves a number of individual system development efforts at FIPC locations and, ultimately, interfacing these locations with the central accounting and finance office (CAFO).

However, the IDA project has been largely decentralized with each of the accounting and disbursing locations developing its own systems and procedures for producing the same reports and information that are presently produced, but with a different paperwork flow. Like project 77-2, cost and property accounting and other possible needs are not being considered at this time. Also, the specific design of the central accounting and finance office and its systems and requirements have not been completed and, therefore, changes that may be necessary for reporting to this office are not being considered.

The bulk of the current IDA effort is concentrated on establishing 16 fully operational FIPCs to integrate accounting and disbursing transaction processing. FIPCs will be linked to "customer" activities by telecommunications lines to allow for on-line data entry, update and inquiry capabilities using random access data base systems.

Implementation of the IDA concept at the FIPCs has been slow and uneven. Only the CNET FIPC has fully achieved phase 2. A major obstacle to IDA's progress is that few existing Navy systems provide a reasonable basis for implementing the IDA concepts.

The data base at the CAFO is to serve as the central repository for summarized FIPC financial information. Although the FIPC development efforts are well along at this time, the CAFO effort is only in a preliminary development stage. A committee

has been organized within NAVCOMPT to formulate objectives and specifications for the CAFO. Thus far, the major efforts of this committee have been to concentrate on identifying the CAFO's reporting requirements and determining the data elements that must be transmitted to the CAFO by the FIPCs.

Also, under Project 77-1, DONPIC is preparing the system specifications for a departmental level reporting system that will include a data base supporting programming, budgeting and accounting. This effort and the CAFO effort should be closely coordinated or, perhaps, undertaken as a single project.

The third and final phase of IDA will be to establish a full telecommunications network linking the CAFO and all FIPCs to each other. Successful completion of IDA depends on the effective implementation of such a network.

In the course of preparing this report, we learned that Navy is considering a major modification to the IDA project. Under the proposed modification, the NETFMS system, which has been installed at CNET in Pensacola, would be the standard financial management system to be installed at all locations except Port Hueneme and Washington, D.C. A separate system (FRAM) would also remain in use for fleet accounting.

This change in approach should help resolve some of the problems associated with decentralized system development and maintenance and diverse financial systems. However, since the Navy has not determined how it will implement the GAO and OSD requirements, the systems expected to be used are not expected to meet those requirements.

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It has not been determined whether these systems can be modified to meet GAO requirements or whether they can be linked to provide the telecommunications network envisioned at a reasonable cost. Our brief review of NETFMS, the systems at Port Hueneme and the system planned for Washington, D.C., disclosed the following.

- Naval Education and Training Financial Management System (NETFMS)

NETFMS is a modern, random access data base system with full on-line capabilities. Implementation of NETFMS has enabled the CNET FIPC to be the first fully operational FIPC in the IDA network. However, NETFMS is currently undergoing a difficult and lengthy conversion due to a change in hardware from IBM to UNIVAC. CNET had planned to stay with IBM equipment and they were not aware of the need to convert to UNIVAC as they were developing NETFMS. All systems, including NETFMS, are being reprogrammed to run on the new equipment and this reprogramming effort has delayed the full realization of IDA at Pensacola. This communication problem underscores the need for better coordination of financial improvement projects.

- Standard Accounting and Reporting System (STARS)

STARS is planned as the system of accounting for departmental level activities in the Washington, D.C. area. An RFP for STARS was issued in November 1979, and Navy plans to have the system up and running by the end of fiscal year 1980.

STARS is to be based on the PARS system that currently processes Navy's procurement transactions. PARS is a modern, data base system that can, hopefully, handle most of the required IDA system concepts. Navy hopes to expand PARS to accommodate O&MN and RDT&E transactions in the Washington area.

Two factors complicate the development of STARS. First, PARS is a complex system that may be difficult to modify for the processing of all Washington area accounting transactions. Second, NAVDAC plans

to standardize the computer network with UNIVAC equipment which may necessitate a conversion of STARS from IBM to UNIVAC. The direct implementation of STARS on UNIVAC equipment could reduce development costs if, in fact, the Navy plans to standardize the computer hardware in the foreseeable future.

- Engineering Field Division (EFD)/Construction
Battalion Command (CBC) Accounting

Two systems are being modified to handle IDA at the Port Hueneme FIPC - the accounting system for EFDs and the accounting system for CBC. The EFD system is an old tape driven system to which a disbursing module and some on-line capabilities have been added. The CBC system is also an old tape sequential system that is currently being enhanced to handle on-line data access and entry for its customer activities. The CBC system will eventually share the EFD disbursing module.

Neither of these systems can fully accommodate the IDA concepts. Although there are no formalized plans to replace these systems, it will ultimately be necessary to replace these tape sequential systems with modern data base systems in order to fully implement IDA at Port Hueneme.

III. HISTORICAL
APPROACH

III. HISTORICAL APPROACH TO DEVELOPING SYSTEMS TO MEET ACCOUNTING AND REPORTING REQUIREMENTS

Systems development and operation have long been decentralized in the Navy. Functional (accounting) systems have been developed along appropriation lines, usually by NAVCOMPT, and have been prescribed in accounting manuals. ADP (processing) systems, that are the implementation of the functional systems, have been developed along command lines, using computer hardware selected by the particular command with system responsibility or selected by NAVDAC. Accounting for individual organization elements has been performed either by accounting activities in the same command as the organization element or by accounting activities that are geographically close to the organization element.

This has resulted in the same accounting requirements being implemented in diverse processing systems and in processing systems that handle the same accounting requirement in multiple ways. For example, accounting for O&M appropriation funds, which occurs at most accounting activities, is performed through numerous processing systems. The procedures, coding and reports for O&M appropriation transactions are different than those for RDT&E appropriation transactions. The processing systems at any one accounting activity must accommodate the differences, even where the basic transaction, such as purchases of goods, is the same.

Diversity of ADP systems and hardware results in a number of limitations. Desirable features of one system cannot be incorporated easily in other systems that employ a different design or operate on different hardware. That often necessitates redesign and duplication of effort in order for a particular system to accommodate a need that is already handled effectively in another system. Generally, systems are unable to communicate with each other, except with expensive devices that can translate the output of one system to a format that is acceptable for input to another system. Thus, information is communicated from one system via messenger service, often resulting in a manual conversion for input to the other system. The result is costly data communication and lengthy lags in reporting among activities and systems. Uniform requirements that are imposed from a central point must be incorporated in each different system, resulting in duplication of effort and the possibility that the same change may be interpreted and implemented differently in one system than it is in another.

The Navy's historical approach to systems development and operation has ensured local control over systems and financial information, giving local commanders maximum ability to tailor systems to their particular information needs. In the days of low transaction volumes and localized operations, this approach may have been effective, particularly since financial information needs were limited to

information about fund status. In today's environment of scarce resources, high transaction volume, transaction complexity, and more sophisticated planning, programming and budgeting practices, we believe this approach is no longer effective. Given the cost of decentralized systems development and maintenance and the difficulty of controlling decentralized efforts, we believe the Navy can achieve substantial savings through a more centralized approach to financial systems. Diversity of systems also impedes Navy's ability to take advantage of many of the potential features of today's hardware and software. The ineffectiveness of continuing the Navy's historical approach to systems development is illustrated by the number of systems and records outside official accounting systems that have necessarily been developed and used because the official systems cannot handle management's needs.

IV. RECOMMENDED
APPROACH

IV. RECOMMENDED APPROACH

Getting the Navy's official accounting and financial processing systems in shape to meet internal needs for timely and reliable financial information and satisfy GAO requirements is a major undertaking. Responding to GAO and OSD requirements, particularly those relating to applied costs and property accounting requires uniform accounting for cost transactions to assure that similar transactions are reported consistently, regardless of how costs are funded or the accounting entity or system through which they are processed and reported. GAO and OSD also require that the accrual basis of accounting be used throughout the Navy, including the field activity level.

Cost accounting is not practiced throughout the Navy and those cost accounting practices that do exist may not be uniform. The Navy Cost Information System (NCIS) was designed some years ago as a departmental level system. The NCIS system has the capability to report against the FYDP, the Navy's principal program structure. However, as explained in the documentation of the FMIP Departmental Reporting System (Project 77-1), the financial and nonfinancial information needed for the NCIS to effectively employ that capability is not available, or is not in a usable form, at the departmental level. Property systems do not cover all of the property that the GAO requires be capitalized, are not

integrated with the basic accounting systems and most are not capable of calculating or reporting depreciation. Accrual accounting information is incomplete and provided only at the departmental level.

The Navy has a number of projects planned or under way to correct many of its existing accounting and financial processing system problems. Many of those projects are within the Financial Management Improvement Program (FMIP), the Navy's present plan for improving accounting and financial processing systems. Most of the various FMIP and other financial improvement projects address specific accounting and system areas, move toward standardization of financial systems and are intended to achieve the following other objectives:

- To improve the timeliness, reliability and completeness of financial information.
- To take advantage of telecommunications and other technological advancements.

These objectives can probably be accomplished most effectively and economically through standardization. The most recent FMIP includes a number of projects which, together, are expected to achieve standard systems by about 1990. There are also a number of financial projects under way or planned outside the FMIP. While these and other projects under way outside the FMIP may ultimately help achieve the objectives of the FMIP, we believe the Navy

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needs a more effective long-range plan that controls and coordinates all financial projects.

There are several reasons why we believe that is necessary. First, some of the programmed FMIP projects, particularly those planned for the mid to late 1980's, have not been clearly defined. As a result, the FMIP as presently structured is largely a statement of broad objectives, rather than a workable plan for achieving financial management improvements. Second, the FMIP does not specifically address all areas where improvements may be necessary. For example, there are no projects that provide specifically for integrating the FIPC network with other systems or provide for comprehensive upgrading of non-FIPC financial systems. Third, financial projects outside the FMIP should be better coordinated with overall plans. Fourth, the Navy may not be able to wait until the late 1980's or 1990 for essential cost information to be provided by its official accounting systems. Fifth, the Navy may not be able to persuade GAO and OSD to wait until the late 1980's or 1990 for Navy accounting systems to meet GAO compliance requirements and OSD mandates. Sixth, needed improvements, including standardization, might be obtained at lower cost through rephasing. Finally, the most recent FMIP is structured to meet the needs identified in a 1974 study. Since that time, there have been substantial internal and external financial developments that have a major impact on the Navy's financial information needs.

The Navy needs an integrated accounting and reporting system that provides Navy management with complete and accurate information on a timely basis and at reasonable cost. The system should be designed to meet the needs of the Navy in both peace-time and war-time situations.

We believe that a standard financial system controlled through a single Central Design Agent will prove necessary to meeting the Navy's long-term financial information needs and may be the most effective way to respond to GAO and OSD requirements. Changing existing systems to meet these requirements before developing a standard system, as called for by the present FMIP, would probably be more costly and would take longer than moving directly to a standard system because of the effort required to change existing systems that are only expected to be temporary.

The first step in developing a standard system should be the preparation of a conceptual design of the ultimate standard system. Before the design can be completed, the Navy must define its internal information needs in more detail, particularly as they relate to cost and property accounting that is required by the GAO and OSD. The Navy must also define a structure of accounting entities that will facilitate the transfer, summarization and reporting of financial information.

We recommend that the following projects be undertaken to provide that information.

1. Cost Accounting

Further research to specifically define GAO and OSD requirements and internal needs for cost and property information. The research should also determine an accounting and reporting framework that would be effective, including the following:

- The level at which general ledgers should be maintained (i.e., accounting entities).
- The nature of information to be transferred among accounting entities or between accounting entities and other data bases.
- Concepts for handling information transfers, e.g., detailed transaction transfer vs. transfer of summarized information.
- The nature of information to be maintained in field level and departmental data bases.
- The concepts for summarizing and reporting financial information.

The research should result in a preliminary revision of the Navy's Accounting Principles and Standard to cover current requirements and recommendations as to an appropriate structure of accounting entities and the feasibility of basing that structure on the uniform identification code system. Illustrations of how the proposed policies and structure would affect present financial information should also be provided to facilitate understanding of the impact of the recommendations.

2. Property Accounting

Research to define appropriate criteria for capitalizing property and a conceptual design of a uniform property system. The research should determine the extent to which existing systems can provide the base for the uniform system and estimate the effort required to design and install the uniform system. The research should result in (1) a recommended minimum dollar level for capitalizing Navy property and justification for a recommended level higher than the \$300 minimum established by the GAO, (ii) the conceptual design of the recommended system and a work plan for development of that system, and (iii) recommended measures that

might be taken outside the property system to reduce the risk of physical loss of property not covered by the system. The research should be performed before preparing the conceptual design of the ultimate standard system because that system will have to be closely interfaced with the property system.

Work on the conceptual design of the standard system can begin while the above research efforts are under way. The conceptual design study should focus on alternative approaches to upgrading the Navy's financial processing network in order to assure that accounting policies and standards can be implemented at acceptable cost. It would be relatively easy to develop accounting policies and standards that are theoretically ideal, but those might be prohibitively expensive. The trade-offs between acceptable accounting theory, accuracy and cost must be carefully balanced to arrive at accounting standards that meet Navy's needs, conform to mandated requirements and can be implemented in a practical manner.

The study should result in a clear plan for upgrading the FIPC network, the definition of a conceptual design of the selected approach and a work plan for the design effort. The study should address the following specific items.

- The practicality of minimizing the number of Central Design Agents involved in financial systems development and support, and organizations that might be the single CDA.

- The practicality of modifying existing systems to accommodate revised accounting and financial systems policies.
- The degree of interface between financial and non-financial systems that might be desirable and practical.
- Present plans that affect financial systems, including hardware and software upgrades.
- Concepts for a standard financial system that might better meet financial information needs.

The Navy's most significant and far-reaching present effort is the IDA project, which was formed to establish an integrated financial processing network. The IDA project is under considerable pressure to achieve an interim goal of effective integration of disbursing and accounting within two to three years. This is planned to be accomplished by installing the NETFMS system, which was developed by the FIPC at Pensacola. The conceptual design study should address the extent to which the NETFMS system or other IDA systems might provide a basis for the standard system. The IDA project and other projects that are under way should probably proceed while the research projects and conceptual design study are being done in order to sustain the momentum of the projects. Because of the significance of those projects, the conceptual design should be completed as soon as possible to minimize the risk of spending substantial sums on existing individual efforts that will have to be replaced by the ultimate standard system. Also, the output

of the cost and research projects are needed, regardless of the approach adopted by the Navy.

While completing the conceptual design study, the Navy should reevaluate the preliminary recommendations of the accounting and property research projects and revise them if necessary. The resulting policies and guidelines should then be discussed with GAO and OSD to assure that they conform to their requirements. The Navy's detailed accounting standards and manuals could then be revised as necessary to conform to the policies and guidelines.

These initial research efforts and the conceptual design will probably take up to a year to complete. They should be started immediately in order for them to be of greatest use in coordinating existing projects and assuring that those projects contribute to the best ultimate accounting and financial processing systems. The initial efforts should also help establish appropriate timing for completing existing projects and for upgrading the FIPC network and provide a basis for preparing an effective long-range plan for financial improvements.

Once the initial efforts are completed, the Navy should study its military personnel, stock and industrial funds and other financial systems and complete its long-range plans for upgrading the FIPC network, making desirable enhancements of those systems and effectively integrating

all financial systems. That plan should be controlled and maintained through the FMIP or another central body and should eliminate the need for local financial improvement projects outside the Navy's official plans.

The research projects and conceptual design study should provide the Navy with the information it needs to make the multimillion dollar decisions on financial accounting and system improvements that are required. We estimate that these initial efforts will cost about \$500,000, as follows:

Cost accounting research	\$100,000
Property accounting research	65,000
Conceptual design study	335,000

	\$500,000
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The time required and cost to achieve standardization depends on the success of existing projects, the extent to which existing systems can be used as part of the standard system, and the way in which the development of the standard system is controlled and coordinated. We estimate that development and installation of the standard system will probably take four to seven years, depending on the approach adopted, specific system requirements and the extent of interface within the financial network that is necessary. We believe that a standard system and other financial improvements now programmed under the FMIP can be achieved

in less time and at less cost if our recommendations are followed.

Appendix 4 includes estimates of the relative cost of proceeding with the present FMIP or accelerating development of standard systems. Appendix 4 also describes an approach to a standard system that might be appropriate for the Navy.

V. COMPLIANCE
REQUIREMENTS

V. EFFORTS NECESSARY FOR COMPLIANCE

In addition to not meeting internal needs for timely and reliable financial information, a number of Navy systems do not comply with GAO and OSD requirements. The GAO and OSD requirements and areas of noncompliance are set forth in more detail in the appendices to this report.

Noncompliance falls into two broad areas - cost accounting and property accounting.

Cost Accounting

The Navy needs cost accounting guidelines and principles that can be uniformly applied in financial information systems. The only existing systems that provide for cost reporting as envisioned by GAO are several NIF systems.

Cost accounting systems should include the following features:

1. Resource costs need to be measured, collected and reported on the accrual basis. Unconsumed resources should be reported as assets of the program and operating entity that has custodial responsibility for them or that is expected to consume them. Consumed resources should be reported as current expenses of the program and operating entity for whose task or mission they are consumed.

Accrual accounting calls for all transactions to be recognized at the time the event giving rise to the transaction occurs. For acquisition of resources, this is usually the time they are received, which will probably precede payment.

Reporting the costs of resources acquired or used at the time funds are disbursed is not acceptable accrual accounting unless disbursement coincides with acquisition or use. Accrual accounting also calls for differentiating between the acquisition and use of resources. Expenses should represent resources consumed in operations rather than resources acquired for operations.

2. Resource costs should be reported in the proper program and operating entity, irrespective of when, how or whether they are funded by Navy. The process of reporting resource consumption in the program or organization that consumes the resources is referred to as "applied costing." Because of GAO's requirement that the costs of any accounting entity include all resources controlled or consumed by that entity, resources that were previously considered "free" (because they were not funded through the program or organization that consumed them) will have to be measured and reported as costs of the program or organization where they are controlled or consumed. This treatment is also required by generally accepted accounting principles (GAAP) for commercial enterprises and state and local governments. For example, repair parts that are funded through procurement appropriations are not presently costed to the activity that consumes them. GAO and GAAP require that this practice be changed and that such items be reported as assets of the program and organization that has custody of the resources until they are consumed, at which time they are to be reported as expenses of the program and organization for which they are consumed.
3. Since resources are often acquired with funds of programs and organizations other than those for which the resources are consumed, complying with GAO requirements will necessitate the reporting of costs between organizations and across appropriations and funds. Since appropriation and fund accounting and reporting will continue to be a key requirement, the effect of GAO requirements is to impose additional accounting and reporting requirements along the program, organization, and other lines that correspond to the ways in which operations are planned, programmed and executed.
4. Reporting between organizations and across appropriation lines requires that accounting principles and transaction processing be uniform to ensure

that like transactions are always handled in the same way. It would not be acceptable for similar transactions to be classified or measured differently solely because they were funded by a particular appropriation, since that would destroy comparability of information about program and organization costs.

5. GAO requires transaction processing systems to be adequately controlled in order to ensure that transactions are processed and reported accurately and reliably. Reporting between organizations and across appropriation lines make it somewhat more difficult to control transaction processing, since the movement of information, as well as summarization and reporting, must be accomplished without error. For best results, internal control requirements should be uniform in order to ensure that all transactions are subjected to a degree of internal control that is appropriate for each transaction.

Cost information should be provided in categories that are meaningful to management. In the case of the Navy, there are several ways in which costs should be classified, some of which, such as the Five-Year Defense Plan (FYDP) program and program element structure, are imposed externally and used for both external and internal purposes; others, such as the OPNAV program sponsor structure, are only used internally; others, such as specific requirements imposed by DOD functional managers, are only used for external purposes.

The DOD uniform general ledger structure being developed will include asset and cost accounts. In order for this general ledger structure to be an effective foundation for Navy's accounting and reporting, the Navy must assure that the individual accounts will facilitate reporting

in categories that are meaningful to Navy management. The Navy must also be able to implement the general ledger structure in a way that will:

- Provide the flexibility to summarize costs in multiple ways.
- Permit allocations to be made through automated procedures using predetermined allocation bases that can easily be changed.
- Facilitate retrieval of specific information for special reporting purposes that may be recurring or nonrecurring.

Cost reporting that complies with GAO requirements and meets Navy's needs will necessitate differentiating between consumed and unconsumed resources and handling the movement of resource information among programs and organizations. This will result in increases in volume and complexity of accounting and will require uniformity of accounting across appropriation and organization lines and strong internal controls. To accomplish this, automation of financial accounting should be maximized and automated systems should be streamlined and enhanced in order to accommodate the volume of transactions and provide effective controls at acceptable costs.

Property Accounting

The Navy needs a uniform system of accounting for military hardware as well as personal property and real property (for which systems presently exist). The existing

real and personal property systems or other existing property systems that are not presently integrated with financial reporting and accounting may provide a good base for a comprehensive property system. In addition to integrating property and other financial accounting, GAO requires that Navy have the capability to calculate and apply depreciation. In evaluating the suitability of existing systems to serve as the base for a comprehensive system, Navy should include depreciation capability as a requirement of the comprehensive system.

Existing property records and accounting do not meet GAO and OSD requirements.

- As mentioned above, there is a fairly complete real property system, but the system does not provide for depreciation and is not fully integrated with financial accounting systems.
- Accounting for personal property is located in a number of property accounting activities that operate independently. Since there is no communication link among these activities, there is no accessible Navy-wide data base for personal property. Also, personal property systems do not provide for depreciation.
- There are logistic and other systems that may provide effective physical control over military hardware and that might be modified to include financial information. There is presently no reliable system of accounting for the financial aspects of military hardware. The logistic and other systems are not integrated with financial systems and do not provide for depreciation.

It would probably be most economical to meet property accounting requirements through centralized or

uniform property accounting systems for the following reasons:

- Centralized systems make it easier to control the transfer of property from one activity or program to another, since the system can be programmed to simultaneously record the deletion from one location and the addition to the other location. With the volumes of property and property movement that exist in the Navy, good control is particularly necessary in order to minimize errors and exceptions, which require considerable time to resolve.
- It is usually less expensive to design and install one system than multiple systems to handle the same function. Subsequent changes need only be implemented once, rather than being duplicated in several systems.
- Changes in principles for property and depreciation accounting are likely, once managers have experience with this information. Uniform systems would provide better flexibility to meet changing requirements and could provide more flexibility as to when and at what level depreciation should be recorded.
- Property information would be more accessible to departmental personnel involved in budget preparation and reviews if the information were obtained from uniform systems that are understood and controlled at departmental levels.

VI. IMPLEMENTING COST
ACCOUNTING

VI. IMPLEMENTATION OF ACCOUNTING AND REPORTING CONCEPTS

In previous sections of this report, we have discussed apparent shortcomings in Navy's historical systems approach and existing systems environment. We have also discussed Navy's needs and external requirements with respect to improved cost and property information. In this section, we discuss some of the impacts that cost and property information are likely to have upon processing systems.

Timeliness of Information

In order to be of use to managers, information must be provided before it is too late to assist in decision-making. Proper implementation of cost and property accounting will substantially increase the volume of transfers of information among systems and organizations. Transferring information requires processing steps that can be time consuming. With modern systems, information transfer can be practically instantaneous. On the other hand, transfer of information through hard copy reports can take days or weeks. With Navy's existing systems, timely transfer of information is likely to be a significant problem because of the diversity in systems and hardware. That problem could be overcome through devices that would automatically translate information from one system to

another, but this approach can be very expensive if substantial volumes of data are involved. Integrated systems operating on the same hardware would facilitate this information flow whether through direct communication between the systems involved or the manual transfer of mechanized files among systems.

Accuracy and Completeness of Information

Information that is received too late has very little value. Information that is incomplete or in error may have a negative value since it might result in wrong decisions. The addition of cost and property information to the information now obtained from official accounting systems will present additional opportunities for error. The need to transfer information among systems and organizations presents additional opportunities for incomplete information should a particular system or organization fail to transfer information on time. In order to minimize the risks of wrong or incomplete information, Navy should provide uniform definitions of information transfers and should incorporate as many error detection and correction controls as possible in transaction processing systems. This would reduce reliance on costly manual controls that can only be as effective as the individual performing the control techniques.

Reliability and Control of Information

In addition to ensuring that cost and property information is accurate and complete, accounting and processing systems must ensure that the information requested by management is, in fact, provided. This requires that effective controls be established to ensure that classification and reporting of information is consistent and uniform throughout Navy. We have discussed previously the control and consistency problems inherent in using diverse systems to perform the same accounting and reporting functions, particularly when the systems are not subject to the same controls. It might be possible to decentralize cost and property reporting requirements and accommodate those requirements in systems other than official accounting systems. That would, however, move the responsibility for interpreting and implementing information requirements to the managers and designers of the various systems involved. The possibility exists that some managers and designers might misinterpret information requirements or fail to provide effective controls over information processing. While it might be possible to minimize this risk through the establishment of a central organization that would review each system, such a group might be prohibitively expensive because of the number of systems that would have to be reviewed. To the extent that the number of systems that process and report cost and

property information can be reduced, the risk of misinterpretation of requirements would be reduced and the ability to ensure that data are controlled effectively would be increased.

Need for Standard System

As stated throughout this report, we believe that cost and property accounting information can be best obtained through an integrated financial accounting and reporting network that employs standard processing systems that are based upon uniform accounting policies and principles, and standard hardware. That approach would provide the capability to produce accurate and reliable information on time and at reasonable cost and should make it easier to accommodate future change.

Navy managers frequently need special information for one-time use, such as responding to specific questions raised by Congress during budget hearings. Standard systems operating on uniform hardware can respond to these one-time or periodic requests, particularly if there is a central organization that knows the system design and the location within the system of the particular information required. This enables those requesting special information to be specific in their requests and to be reasonably confident that their requests will not be misinterpreted by the system

operators who must extract and report the information. It could even be possible to establish a central point that could directly access the processing systems and data bases, providing an almost instantaneous retrieval ability. Navy also needs to be able to respond to future requirements that cannot be anticipated or clearly defined at this time. Some of these requirements will undoubtedly necessitate revision and reprogramming of systems. Such revisions can be handled most effectively by a central group that is intimately familiar with the systems to be modified. Similarly, changes can be implemented most effectively in one standard system.

The projects encompassed in the financial management improvement program indicate that the Navy concurs with our preliminary view that system standardization is the best answer to meeting Navy's financial information needs. The question at this point is not whether standardization is desirable, but rather how soon it can be accomplished in an affordable way.

APPENDIX 1
COST INFORMATION

SUMMARY OF COST INFORMATION NEEDSIntroduction

The Navy needs accurate cost information to help estimate the costs of programs and activities, monitor resource use and make correct operating and budgeting decisions.

Accurate cost estimating is especially critical since the funds available for new research and procurement, which are essential to long-term capability, are likely to be the part of the budget remaining after operating and support costs have been provided.

Historical cost information is important in estimating the cost of future programs. For example, the costs of DD963 class destroyers and FF1052 frigates might be the basis for estimating the costs of a new ship class, such as the DDGX. Similarly, the costs to operate and support the DD963's and the FF1052's might be the basis for estimating the operating and support costs for the DDGX.

Reliable cost and resource data are also useful in evaluating trends and identifying situations that may need management attention, such as increasing backlogs of overhaul and repair work, which may suggest asset deterioration or resource deficiencies. Operating decisions on base closures and ship decommissioning require information that helps

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determine the actions that produce the greatest cost or resource saving. Congressional debate on selecting the shipyard for the SLEP carrier program was heavily involved with cost issues and the debate disclosed that military personnel costs had been excluded in estimating the cost of one alternative.

The above are only a few examples of Navy's need for timely and reliable cost information. These needs are presently met not through the official accounting system but through various informal systems and memoranda records for which there are no uniform guidelines or definitions and which may vary considerably as to reliability and content. GAO has cited a number of deficiencies in Navy systems which add up to the need to provide consistent and reliable cost information from official accounting records and systems.

On the basis of discussions with OSD and GAO representatives, NAVCOMPT personnel have categorized Navy's accounting problems in four areas:

- Applied costing (cost allocation). Resource costs should be reported in the proper program and/or organization, regardless of how or whether they are funded.
- Accrual accounting. Transactions should be recognized at the time they occur. Revenues and costs should be recognized at the time services are provided or resources are acquired. Expenses should be recognized when resources are consumed and identified to the program and organization that uses them. Resources should be recognized as assets of the program and organization that has

custodial responsibility or is expected to consume them, until they are used.

- Property accounting. Property information should be integrated with official accounting records for all assets, including inventories and military hardware.
- Depreciation. The value of fixed assets used should be allocated to the programs and organizations benefiting from the assets' use, over the period during which they are consumed.

The Navy currently has 40 accounting systems subject to GAO approval. Of these, 30 (principally payroll and industrial fund) have been approved, and the remainder are under review by the GAO or scheduled to be reviewed after incorporating GAO requirements. The Navy has 14 additional systems which are under development and will require GAO approval upon completion.

The Assistant Secretary of Defense (Comptroller) has recently issued two memoranda that require the military services to comply with new DOD cost and property accounting principles, which are consistent with those prescribed by the GAO. The Navy has established specific targets for achieving compliance with GAO and OSD requirements.

The need for improvements in financial systems and information seems clear, both for internal use and to satisfy external requirements of GAO and OSD. The questions appear to be "what" the improvements should be and "when" and "how" to implement them, not whether they are necessary.

The questions of when and how to implement the improvements deal with the structure through which better information should be provided. The rest of this paper summarizes some of the key issues in deciding what information should be provided, to whom and in what formats, and consists of the following sections:

- GAO principles and requirements.
 - . Applied costing
 - . Accrual accounting
 - . Property accounting
 - . Depreciation
- Relationship of GAO principles to Navy accounting.
 - . Applied costing
 - . Accrual accounting
- Providing better information.

GAO Principles

The GAO defines "cost" as the financial measure of resources consumed in accomplishing an agency task or mission such as providing a service, carrying out an activity or completing a project.^{1/} This definition is broader than "obligations" or "expenditures" for it includes both funded and unfunded resources. It also requires that resource accounting be performed where the resources are used, as well as where they are acquired, and requires that resource accounting reflect when resources are used as well as when they are acquired.

^{1/} GAO, Accounting Principles and Standards for Federal Agencies, 1978, Sec. 16.1 pp. 2-44.

The GAO requires that agency accounting systems provide for the systematic accumulation of costs by major organization segments, budget activities and programs.^{2/} Otherwise, the systems do not meet the statutory objectives of full disclosure of agency performance, production of useful financial management information and justification of budgets with performance and cost information. GAO has not defined the specific organizations, budget activities or programs for which costs must be collected. These are decisions of the agencies that use the information. Thus, the Navy has the flexibility to make its own decisions about organizations, budget activities and programs that will result in the most meaningful information for internal use.

Accrual accounting is legally required of all Federal agencies. GAO defines accrual accounting as the recording of significant and accountable aspects of financial transactions or events in financial records as the events occur.^{3/} GAO permits some flexibility in accrual accounting techniques, depending on the nature and transactions of particular agencies and agency components. However, accounting only for obligations and disbursements clearly does not meet accrual accounting requirements. Systems must also properly

^{2/} GAO, Accounting Principles and Standards for Federal Agencies, Sec. 16.4 pp. 2-46.

^{3/} Ibid, Sec. 9.1 pp. 2-14.

present information about unconsumed resources, uncollected revenues and unpaid expenditures.

GAO has established the following requirements for property accounting:

- A system of financial accounts for property should be maintained, which tracks cost, quantity and location.
- Property should be recorded at cost; if cost is not known, reasonable estimates or other bases may be used.
- Factors to be considered in establishing capitalization criteria include length of service life, repetitive use, frequency of replacement, retention of identity when placed into use, cost, and the significance of improvements in terms of increases in usefulness, service life or capacity.
- Periodic physical inventories should be taken and reconciled with the financial records.^{4/}

GAO considers that all fixed assets, including military hardware such as ships and aircraft, should be capitalized and included in the financial property records. Currently, military hardware is excluded from Navy's property accounting systems. Also, the property accounting systems are not integrated with financial accounting systems, which is required by GAO. Shipboard inventories are also excluded from the financial accounting systems.

GAO requires that accounting systems be able to calculate and report depreciation, which is defined as an

^{4/} GAO, Accounting Principles and Standards for Federal Agencies, 1978, Sec. 12.5 pp. 2-27-35.

estimate of the portion of the total cost of a long-lived capital asset consumed through use, approaching obsolescence or having other reason to be assigned as a cost of operation over the asset's estimated useful life.^{5/} GAO requires that depreciation be recorded whenever the need arises for periodic determination of the cost of all resources consumed in performing a service or job. The required situations include:

- Reporting financial results of operations where costs in relation to revenues are to be fully disclosed.
- Reimbursement for services where legal or administrative requirements call for reimbursement to be on the basis of full cost.
- Where investment in fixed property assets is substantial and management needs total cost information.
- Where total cost of self-constructed assets is needed to determine the amount to be capitalized.

GAO has not defined specific property accounting principles or methods of depreciation, service lives or instances where depreciation must be reported. As with decisions about reporting costs, this leaves Navy with the flexibility to establish specific principles which are most meaningful for internal use. Given the importance of information about the cost of previously acquired property in estimating the cost of new acquisitions and the need to expend substantial portions of Navy's funds to operate, maintain and support property, it is clear that reliable information

^{5/} GAO, Accounting Principles and Standards for Federal Agencies, 1978, Sec. 12.5(h) pp. 2-35-37.

about property values and use is important. The exact nature of information that would be useful is less clear. The Navy should undertake research to define its information needs, not only to ensure that the right information is obtained, but also to provide bases for influencing GAO and OSD against requirements that might result in unnecessarily detailed or costly accounting practices. For example, GAO has prescribed that all assets costing more than \$300 be capitalized and that accounting systems be capable of determining depreciation for all capitalized assets. While these requirements may be appropriate in some instances, such as pilferable property and reimbursable activities, across the board compliance might require costly efforts that would do little to improve management information.

GAO believes that, in today's environment, a single integrated financial system, properly designed, can provide for program information and appropriation information needs. OSD shares this view, which it has adopted in its work toward a uniform DOD-wide general ledger structure that would be implemented by all the services. This uniform account structure, which is an important part of revising the Navy's financial systems should incorporate useful cost and property information on an accrual basis.

Relationship of GAO Principles to Navy Accounting

As previously noted, many of the Navy's accounting systems have not been approved by GAO because of deficiencies

in accounting for applied costs, accruals, property and depreciation.

Applied costs is perhaps the area which has the greatest impact on the Navy. There is an increasing internal need for information about the full costs of Navy programs and operations, particularly for planning and budgeting. However, because it is not available from most accounting systems, managers must obtain this information from memoranda and other records, which may not be consistent or complete. Current accounting systems focus on appropriations, obligations and expenditures, rather than on program expenditures and costs. As a result, financial information is generally limited to the acquisition of resources through Navy appropriations.

Specific shortcomings in the area of applied costs include:

- Some costs are not captured or reported. These include unfunded costs such as GSA leased space, shared facilities and OSD-funded personnel benefits. Costs of retirement benefits for Navy military personnel are neither funded nor accounted for by Navy. While it might not be practical or necessary to record all of these costs in the basic accounting system, they should be captured in some way, perhaps through statistics, for use in planning decisions. Otherwise, such decisions might be based on information that significantly understates true cost.
- Costs reported at the wrong time. These are costs of resources paid for in one period, but consumed in another period. The clearest examples are

materials and supplies inventories and fixed assets. The cost of these items should be recorded as assets at the time of purchase (expenditure) and reflected as expense when they are used. However, except for Navy Industrial Fund activities, these assets are "expensed" when purchased and there is no financial accounting during the period they are held for use or the time they are used.

- Costs reported in the wrong place. Current systems identify resources to appropriations through which they are funded, rather than to programs or organizations where they are used. Special studies may be necessary to piece together costs funded through several appropriations. These special studies are time-consuming and expensive.

As with any financial information, cost information must be reliable and consistent to be useful to management. This requires that cost principles be prescribed or approved centrally, on the basis of guidelines that reflect management's information needs. Otherwise, different costs may be included in a particular program, or different bases may be used by one manager than another responsible for a similar program. For example, one activity may decide to report certain overhead costs as a separate cost element while another activity decides to allocate the same types of costs among other cost elements.

One of the purposes of accrual accounting is to ensure that costs are reported at the right time. There are a number of areas where the nature of transactions or the place where they occur present timing problems. These include:

- Fleet accounting. Fleet units that are out of port often cannot report their transactions promptly. Consequently, vendors may present bills for payment before any obligation information arrives from the ship and resources may be consumed long before an accounting activity is notified.
- Overseas activities. Overseas activities may also be slow in reporting transactions because of the problems of communicating over long distances. While this may be corrected in the long term by extending the IDA concept to overseas activities, there are no plans to do so, at least until IDA is working in the continental United States, which may be a number of years.
- PCS and other travel and moving costs. These costs may not be incurred or recorded until long after the travel occurs, when reimbursement claims are filed. Since entitlement may last for several years, this can result in not recording costs of a transfer until one or more periods after the transfer is completed. This has also resulted in overexpenditures, since obligations must be established before the end of the year of transfer.
- Contracted goods and services. There can be problems obtaining timely information from contractors and contract administrators, particularly for performance or deliveries not yet billed. "MILSCAP" (military standard contract administration procedures) is intended to partially solve this problem by having DCASRs send inputs to Navy activities on a daily basis. IDA also hopes to improve the Navy's ability to process transactions quickly. Until these efforts are completed, however, this remains a problem. A good solution to these problems may be to use estimates and standards, adjusting these estimates through revisions of standards when actual transactions are processed. The use of standards is discussed in more detail in Appendix 2.

Examples of costs that may not presently be captured and reported on acceptable bases include:

- Pay and allowances of military personnel. Military personnel costs are to be determined for local use

but need not be reported. Also, not all activities are required to determine these costs locally. As a result, total costs of military personnel, as opposed to current disbursements, are not reported.

- Earned leave. The cost of civilian and military annual leave earned but not taken is only recorded statistically at year-end at the departmental level. These costs should be recorded in the period in which leave is earned in order to determine the cost of productive labor and Navy's liability for these benefits.
- Pension and retirement benefits. These costs are not recorded by the Navy because they are funded and paid by agencies outside the Navy. However, since they represent a significant part of total personnel costs, they should be recognized at some level in order to capture all significant costs of programs and operations that will have to be funded in the future.
- Property and depreciation. Depreciation is recognized only at Navy industrial fund activities. Depreciation of other property cannot be accurately calculated due to the omission of much of the Navy's property from the property accounting systems (principally military hardware).
- Unfunded costs. Costs which are not paid through Navy appropriations, such as GSA leases, are not reported. Another example of unfunded costs is the use by the Navy of facilities funded by other services or agencies. Joint Service schools, shared facilities like the Pentagon and Andrews Air Force Base and regional use of military and Veterans Administration hospitals are further examples.

Providing for Better Information

We believe the Navy should improve its financial systems and information and do so in a way that will also satisfy GAO requirements. The improved financial systems should include the following features:

- Costs should be recorded through a centrally designed and controlled accounting system. This is the best way that standard principles and procedures, which are essential for reliable and comparative information, can be assured.
- The accounting system should be based on reporting elements for collecting and reporting against meaningful programs, organizations and other cost objectives. The reporting elements should also be the Navy's accounting entities that would use the uniform general ledger structure being developed on a DOD-wide basis.
- The reporting elements should be structured to collect information uniformly but provide flexibility for summarizing and reporting. Uniformity and discipline are needed to ensure accuracy and consistency and can be provided through a basic chart of accounts, clear accounting principles and controlled processing. The chart of accounts can be maintained at a level that provides the flexibility to collect and report data in different configurations for different managers and purposes.
- Property systems should be expanded to cover all fixed assets, and include the capability to compute and allocate depreciation costs. Additional research should be undertaken to provide a basis for deciding specific valuation and depreciation policies.

When considering alternatives, the Navy should:

- Only implement accounting systems and changes that are practical. Accounting systems or changes that do not serve the needs of Navy management or that are not practical should be changed or dropped.
- Be in a position to convince GAO and OSD that accounting requirements that are not practical should not be adopted. The best way to do that is to take the initiative, through authoritative studies on controversial areas (such as the \$300 capitalization criteria) and other measures that put Navy in a position to persuade GAO and OSD to Navy's view.

Table 1 to this appendix sets forth specific areas in which Navy systems and information do not meet the requirements of GAO and OSD.

DEPARTMENT

MATRIX OF NAVY ACCOUNTING

NONCOMPLIANCE

Navy Accounting Areas:	<u>Fleet Accounting</u>	<u>Military Personnel</u>	<u>Real and Personal Property and Military Hardware</u>	<u>Travel</u>
<u>Noncompliance Areas</u>				
Applied Costs	Costs not fully applied in fleet to organizations, units or missions. "Costing" based on expenditures incurred by OPTAR.	Costs are statistically recorded by activity. Actual costs are not applied.	Assets are not capitalized in the accounting system.	Problem activity bear the travel costs. The relativity, activity high level
Accrual Accounting	Transactions for resources consumed are not reported on a timely basis. Costs are not accrued.	Actual costs are not accrued at activity level.	Since assets like ships are not recorded on the books, Navy is not accruing all construction in progress related to nonrecorded assets.	Travel costs are not recorded until personnel
Property Accounting	Fleet accounting is not doing property accounting within financial accounting system.	Military personnel costs are not included in capitalized asset values.	Most assets are not recorded in the accounting system.	
Depreciation	Depreciation is not recorded.	N/A	Depreciation is recorded in NIF only.	

Table 1

DEPARTMENT OF NAVY

NAVY ACCOUNTING AREAS VERSUS

NONCOMPLIANCE AREAS

<u>Travel and Moving Costs</u>	<u>Annual Leave</u>	<u>Other Unfunded Costs</u>	<u>Goods and Services</u>	<u>Stock Issues</u>
Problem of which activities should bear the cost of travel and moving costs. (Example: The releasing activity, receiving activity or some high level pool.)	Costs of leave earned but not taken are not applied regularly or at proper level.	Not applied or recorded.	Are assumed to be applied when acquired. Many costs are not reported by using entity.	Customers are not charged for usage of stocks such as aircraft component parts.
Travel and moving costs are not recorded until after claim is filed. Reserve personnel are covered.	Leave earned but not taken is not accrued in the accounting system. It is statistically accrued at year-end for entire Navy.	Not recorded.	Not practiced at proper level or used for all transactions.	Stocks are not necessarily consumed when issued, as accounting indicates.
N/A	N/A	Not recorded.	Construction in progress on property excluded from general ledgers is excluded.	Stock issued but not consumed is not capitalized.
N/A	N/A	Not recorded.	Capitalized goods are not depreciated.	N/A

APPENDIX 2
APPLIED COSTS

REPORTING ELEMENTS FOR APPLIED COSTSIntroduction

DOD Instruction 7220.9-H, dated August 1, 1972, defines applied costs as "the cost of resources acquired, put into use or consumed (or otherwise disposed of), depending upon the nature of the program concerned and the programming and budgeting provisions governing its financial management." Applied costing refers to the process of identifying, recording and summarizing costs in reporting categories that are meaningful to managers. There are a number of categories in which costs may be reported, which generally fall into two broad groups:

- According to the program, product or other result for which the costs were incurred.
- According to the responsible organization element that incurred the costs.

Each reporting category consists of various units for which information is desired. For example, FYDP reports should include information provided according to FYDP program and FYDP program element. The FYDP program elements, and similar task or mission units, are referred to as "cost objectives" and the FYDP programs and similar units at the final accumulation point (departmental level) are referred to as "final cost objectives."

In situations where final cost objectives are defined in only one way and where each organization element can be clearly identified with one cost objective, or each cost objective can be clearly identified with one organization element, applied costing can be accomplished fairly simply through a fixed, pyramidal reporting structure.

In the Navy, however, final cost objectives are defined in a number of ways. There are functional and technical reporting categories as well as line organization reporting categories. A number of organization elements may be involved in one cost objective and any one organization element may contribute to a number of cost objectives. In addition, there are various internal and external requirements for summarizing costs in other ways, such as the total cost of a particular type of resource, according to the appropriation funding the cost and according to specific deliverable products.

In this appendix, we explore internal needs and external requirements for summarizing cost information in ways that are useful and a structure of reporting elements that would enable the Navy to satisfy those needs and requirements in a logical, feasible and effective manner.

Navy's Needs for Applied Cost

Navy's need for reliable applied cost information seems clear, at least for planning, programming and budgeting, where historical cost is important in estimating future costs and budget requirements. Cost information also has a clearly significant role in make or buy decisions, in-house or contractor decisions, recovery under reimbursable programs and in reprogramming decisions. The need for reliable applied cost information for monitoring and evaluating program execution seems to be less clearly perceived in the Navy, although cost information plays a primary role in monitoring and evaluation in most organizations outside the Navy. The lack of emphasis on cost management in the Navy may be due to the emphasis on controlling through budgets and the limited experience of many managers in using actual cost and performance information.

In this project, we concentrated principally on the need for reliable applied cost information for planning, programming and budgeting since the needs in these areas are more clearly defined and better accepted than the needs for cost information in managing program execution. Also, information that satisfies planning, programming and budgeting needs should satisfy most needs of those managing program execution.

In order to be useful, cost information must be summarized into reporting categories and final cost objectives that are meaningful to management. Since the Navy plans, programs, budgets and executes through the many Navy organization elements, cost information along organization lines is clearly needed. Navy plans and operations often result from the cooperative efforts of line and staff organizations that execute the plans and functional or technical organizations that support the line and staff organizations. Functional managers may be most interested in information about a particular weapons system or production process while line managers may be more interested in information about combinations of different technical items, such as a task force or a base.

The Navy's budgets and many of the Navy's present accounting systems are based on appropriation structures. Accounting for individual transactions focuses on the particular fund (allotment, OPTAR, revolving fund, etc.) under which receipts or expenditures occur and which, in turn, usually identifies the purpose of the receipt or expenditure and the organization responsible for the fund. This focus on fund entity, which probably results from the legal implications of budget violations, complicates applied costing. In order to accumulate all of the costs associated with a particular program, it may be necessary to identify and summarize information about a number of fund entities. The

appropriation based systems also focus on the program and organization that funds resources rather than on the program and organization that uses the resources, as required by applied costing. To the extent that applied costing is performed by the Navy, it is generally accomplished through reimbursable orders and special coding of individual transactions.

A program designed to deliver a certain defensive capability consists of weapons and communications systems, other property, parts and supplies support, fuel and other consumables, personnel, some part of the shore establishment and other resources combined to perform a mission. This is how the Navy operates and various logistics, maintenance, tracking and other operating systems exist to help manage missions. How the components were funded is of little importance to either the planning and programming or the execution of missions, except to the extent of funding or other constraints. Information about the availability and use of physical resources in performing tasks and missions and the organizations that hold and use resources is easier for operating managers to understand and more useful than information about the funding of resources. That information can be provided more easily from a modern integrated official accounting system that focuses on the costs of missions and organizations than by assembling the information from multiple systems that focus on receipts and expenditures of fund

entities and necessitate high volumes of reimbursable orders and complex coding of transactions.

GAO and OSD Requirements

GAO requires that agency accounting systems provide for accumulating costs by (1) major organization segments, (2) budget activities and (3) program structures. Recently, OSD accounting policies have been changed to require that accounting systems provide for summarizing significant costs incurred as a result of operations or performing services or functions. OSD intends that these costs be assigned to final cost objectives based on the beneficial or causal relationship between the cost incurred and the cost objective.

Navy efforts to obtain GAO approval of its accounting systems have been frustrated in part by inability to meet these requirements for applied costing. Costs are to be reported according to the organization that uses a resource and the budget activity and program for which it is used, irrespective of how the cost is funded or when the resource was acquired. When resources are held or used by an organization that did not fund the cost, information about the cost is to be transferred from the funding organization to the using organization. Today's volume of such transfers is probably much lower than the volume that will be required under full applied costing. To the extent possible, these transfers should be automated in order to reduce the cost

and risks of error associated with reimbursable orders, complex coding of transactions and other manual procedures.

Regardless of whether information is transferred through automated or manual means, accounting for individual cost transactions must be uniform to assure that similar cost items are reported the same way, irrespective of how they are funded or the accounting systems through which they are processed.

Selecting Final Cost Objectives

The beginning of Navy's operating cycle is planning, followed by programming, budgeting and, ultimately, execution. As explained earlier, we focused principally on the planning, programming and budgeting (PPB) functions, for which information must be presented in a number of ways. These include (i) the Five-Year Defense Plan (FYDP) program and program element structure (which, except for accommodating new research and procurement items, is fixed), (ii) the decision unit and Consolidated Decision Package Set structure (which changes with mission requirements), (iii) the OPNAV sponsor structure (which is oriented to functions and can change through reorganization), (iv) the Program Operating Memorandum structure (POM - which should correspond to the FYDP structure), and, of course, (v) the appropriation structure. These are the principal structures used at the departmental level and represent different sets of final

cost objectives. There are also specific structures required by Navy and/or OSD functional managers, such as those for research and development, and whatever unique structures may be used at intermediate commands and field activities. Information is also required in categories such as object class, functional categories and expense elements.

Exhibit 1 sets forth four sets of final cost objectives that should be used by the Navy in summarizing cost information; there are others that are required for at least part of the Navy's resources. This exhibit illustrates that Navy needs more than one set of final cost objectives and that it should have the flexibility, within reason, to add, redefine or drop cost objectives, as dictated by management's needs. Accounting systems must be capable of accommodating management's need for flexibility in defining cost objectives and providing reliable and timely information according to those objectives.

Reporting Elements

While management must have the flexibility to change the definition of cost objectives, such changes should not affect the basic accounting for or coding of individual transactions. Recording individual transactions according to cost objective could necessitate coding every transaction with each of the cost objectives (appropriation or fund, program, organization, etc.) to which it relates and

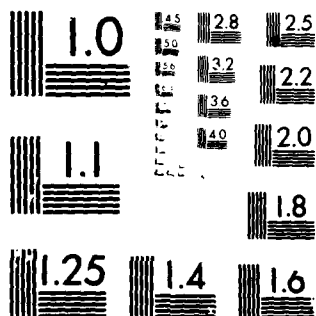
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summarizing each transaction several times - once for each cost objective. Changes in the definition of cost objectives would necessitate revising codes, which would be hard to keep up-to-date. There would also be substantial risks that errors would result because of the number of codes involved.

The accounting system should be based on a structure of reporting elements that correspond to organization segments. Individual transactions should be identified according to the organization segment (reporting element) involved. Reporting elements should be defined at a low enough level to permit their costs to be summarized directly into final cost objectives or allocated to other reporting elements that could be summarized directly into final cost objectives. Management would decide the final cost objectives into which the costs of each reporting element should be summarized in tables that would permit automatic summarization and reporting. Changes in cost objectives and the assignment of individual reporting elements to cost objectives would be made through changes to the tables, without affecting the definitions of reporting elements or accounting for individual transactions.

Reporting elements whose costs could be summarized directly into final cost objectives would be primary reporting elements. Reporting elements that support other reporting elements would be secondary reporting elements, the costs

of which would be allocated to the reporting elements that they support. Transactions, including allocations of secondary reporting element costs, would only have to identify the reporting element involved in order to be reported in the proper cost objectives.

Each reporting element should be an accounting entity and use a uniform general ledger that classifies costs according to the nature of resources for recording and summarizing its transactions. That should assure consistent classification of transactions and facilitate automation of cost allocation processes. The general ledger would also provide object class information to be reported to OSD and OMB. An illustrative structure of expense elements that might be incorporated in the uniform general ledger is set forth in Exhibit 2.

An illustration of a possible reporting element is an individual hospital. Transactions specifically attributable to the hospital would be recorded directly in its general ledger. Costs incurred by other activities that support the hospital, such as base overhead and motor pool, would be allocated to its general ledger. The hospital's total costs would be summarized directly into the applicable FYDP program (training, medical and other services), function (medical services), command organization (BUMED) and OPNAV sponsor (093). Should management decide that medical costs

should be allocated to other cost objectives, rather than considered as a separate cost objective, the hospital's costs could be allocated among the several objectives on the basis of the reporting element to which an individual patient was assigned, without affecting the way in which individual transactions are coded or processed. Should the cost objective (task) of the hospital be redefined, for example from delivery of medical services to training or research, its costs would be summarized into the new cost objective by changing the summarization tables, again without affecting the way in which individual transactions are handled.

The scope of our contract precluded an in-depth study of the Navy's field organization, detailed structures of accounting entities or specific bases for designating primary and secondary reporting elements. However, based on the work we did perform, it appears that the unit identification code (UIC) structure provides the most logical basis for the detailed structure. The UIC structure is already in existence, appears to be well understood, relates to organization segments and, for the most part, is at a low enough level to permit summarization of costs directly into cost objectives. UICs with multiple functions that result in their supporting more than one cost objective, but that do not serve other UICs, could establish separate cost centers and subsidiary ledgers for their different functions. These cost centers would be treated as separate elements for summarizing and

reporting costs. Alternatively, the total costs of the UIC could be allocated among the various cost objectives that it supports. Using the UIC structure should be economical since it already exists and personnel are familiar with it. Additional research, as described earlier, is necessary to conclude positively as to whether use of the UIC structure is feasible, but we believe it is a prime candidate for the basis of the accounting and reporting structure.

Responsibility Reporting

Reporting cost and other financial information according to responsible organization elements is already practiced by the Navy to the extent of budget responsibilities. Responsibility reporting of costs calls for distinguishing between controllable and noncontrollable costs. Normally, only those costs that are under the control of a particular manager should be attributed to him.

This concept presents some problems in the Navy, where managers responsible for the custody or efficient and effective use of a resource may have little or no control over the assignment, cost or funding of the resource. For example, managers of operating units have some voice in establishing military billets for their units but may not make the final decision or have control over the cost of military personnel or the specific individuals assigned to them, which is the responsibility of NAVPERS. It would not

be logical to hold a unit commander responsible for the extra cost of an enlisted person with 10 dependents over the cost of an enlisted person with no dependents or the extra PCS travel costs of a person transferred from Japan to Norfolk over a person transferred within Norfolk. Similarly, he should not be responsible for the fact that he was assigned hardware with a particular configuration that is more expensive than that of a counterpart who was assigned less expensive hardware for a comparable task.

However, these practical problems do not preclude the need for information about the custody and use of resources by those responsible. Excluding this information on the basis that the managers could not control the cost might remove needed information about programs and effectiveness of resource application. It may also be most economical to obtain information about programs and functions through the general ledgers applicable to the reporting element for which the resources are acquired and used. Information needed centrally but not locally could be selectively reported to central points without including such information in local reports.

We believe the problem resulting from mismatch of cost and resource responsibility can be resolved by assigning actual costs to the manager of the reporting element that controls the cost, then using standard cost factors to

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basis of uniform rates for each grade and rating so that the cost of an E-5 machinist mate would be the same in any program or function where an E-5 machinist mate is used.

Additional research is needed to determine specific units to be costed and costs to be included in determining standards. For example, should medical costs and overhead costs of NAVPERS be included in standard labor rates and distributed to the reporting elements to which personnel are assigned or treated as separate cost objectives? However, the use of standards as an overall approach appears to be a sound and relatively simple way to satisfy the separate needs of those who control costs and those who control resources.

Allocation of Costs

It is unlikely that cost objectives and reporting elements can be structured in such a way that every reporting element can be summarized directly into one cost objective. There are bound to be costs and reporting elements that support other reporting elements or that support more than one cost objective and must, therefore, be allocated.

There are critics of allocation who claim that allocation is a questionable practice because of the cost and lack of precision of the allocation process. There is no question that allocation can be expensive if overdone and that allocation cannot often be done with perfect accuracy.

On the other hand, there is also no question that excluding significant portions of costs or reporting costs in the wrong cost objectives seriously reduces the usefulness of information to managers. The key to effective and economical cost allocation is selecting allocation methods that are practical to use and providing guidelines for ensuring that allocation is used only when the need for the resulting information justifies the cost of the allocation process.

There are a number of basic principles that should be observed in cost allocation, including the following:

- Allocation should be on a total basis rather than a selective basis. To the extent possible, reporting elements should be either totally allocable or totally nonallocable to simplify allocation. Where this is not possible because a reporting element includes primary and secondary costs, the allocation system must ensure that the total of the costs allocated out and costs retained is not different than the total of the cost pool.
- Costs should be allocated only to levels where they are relevant and where allocation is practical, particularly in the case of downward allocation of supervisory or overhead costs.
- Cost allocation decisions should be made at the first level where an individual manager has control over both the units from which costs are to be allocated, and the units to which costs are to be allocated.
- Allocation decisions and methods should be reviewed regularly. Feedback from unit managers receiving allocated costs should be obtained and used in these reviews.
- Complex and costly allocation methods should not be used where acceptable accuracy can be obtained through simpler methods.

There are a number of cost allocation methods, each of which falls into one of the following four overall groups. These are listed in descending order of objectivity and accuracy.

- Resource consumption measures - This is the least subjective and most accurate method and can be used fairly easily where there is a direct correlation between resources consumed, and the activity served. Costs would be allocated through a ratio of cost per unit of resources consumed in serving a particular activity. An example is the costs of a timeshared computer, which can be allocated to customers in proportion to computer time used. These measures can be regarded as cost distribution techniques because of the direct relationship between cost and services provided.
- Output measures - This method is useful where resources consumed can not be identified to activities but can be identified to products or other output that, in turn, can be identified to activities served. This method is effective where there is a correlation between volume or type of output and costs incurred. Costs per unit of output would be determined and allocated by pricing the output. For example, a print shop could determine cost per printed page and allocate total cost on the basis of number of pages produced and delivered. Many of these measures may also be regarded as cost distribution techniques.
- Surrogate measure - If neither resources consumed nor output generated can be easily measured and correlated to costs, then a surrogate measure that is reasonably representative of resources consumed may be used. For example, costs of a food service facility could be allocated on the basis of number of persons served rather than meals produced or food and other resources actually consumed.
- Measure of activity - This group of methods is used where costs cannot easily be correlated with an objective measure. Allocation is made on the basis of some user attribute, such as number of people or size of budget. For example, the costs of a headquarters unit might be allocated to the units managed on the basis of relative unit size, as measured by numbers of personnel.

There are a number of specific allocation issues that the Navy must resolve, particularly if it is to perform applied costing in an economically feasible manner. These include:

- Whether command overhead costs must be allocated down to field activities.
- Whether general support costs, such as indirect base operations must be allocated to the operating units located on the base.
- Whether all general and support costs should ultimately be allocated to line units.
- The minimum necessary degree of precision in making cost allocations.

It would be easy for applied costing to be overdone, particularly if GAO and OSD requirements are interpreted too literally. However, the GAO and OSD requirements provide reasonable flexibility in selecting methods of applying costs and state that methods whose cost cannot be justified should not be selected. A standard cost approach such as we have recommended should help simplify many of the allocations that are likely to be necessary. In other cases, such as command overhead and general support costs, necessary allocations can be made at departmental levels or statistical data used in place of detailed cost allocations to meet information needs. For example, command overhead cost can be summarized separately and evaluated on various bases, such as personnel assigned to the command, number of programs supervised, property and other resources managed or total dollars managed.

Statistical factors could be developed for estimating the effect of program decisions on command overhead for use in planning, programming and budgeting. Such an approach might be more informative than allocating these costs to the command's field level reporting elements since the overhead costs and direct program costs would be separately identified. Decisions on applied costing must be made very carefully to avoid adopting requirements that would be unnecessarily complex and costly.

The Navy should undertake further research to provide a basis for deciding on a detailed structure of accounting entities that can accommodate applied costing and practical guidelines for applied costing that meet the Navy's needs. That would be followed by the preparation of detailed accounting principles for uniform use in systems throughout the Navy.

Exhibits 1 and 2 illustrate departmental final cost objectives that might be adopted and expense elements that might be used to classify individual cost transactions in the general ledgers of the reporting elements. Exhibit 3 sets forth definitions of some of the terms used in our discussion of applied costs.

ILLUSTRATIVE SET

<u>Five-Year Defense Plan (FYDP)</u>	<u>OPNAV Structure</u>	<u>Com</u>
Strategic Forces	Staff Functions	<u>CNO Plan</u>
General Purpose Forces	Information	OCEAN
Intelligence and Communications	Decision and Coordination	NAVTEL
Airlift and Sealift	Legal Service	NAVINT
Guard and Reserve Forces	Mar Corp Liason	NAVSEC
Research and Development	Service Functions	<u>CNO Proc</u>
Central Supply and Maintenance	Program Planning	RDT&E
Training, Medical and Other	Naval Reserve	NAVAIR
Personnel Activities	Inspector General	NAVSEA
Administration and Support	Intelligence	NAVFA
Support of Other Nations	Operating Functions (Programs)	NAVEL
	Command and Control and	NAVSU
	Communications	SSPO
	ASW and Ocean Surveillance	<u>CNO Oper</u>
	Research	CINCL
	Manpower	CINCP
	Submarine Warfare	CINUS
	Surface Warfare	CNAVRI
	Logistics	Navy
	Air Warfare	Comm
	Plans, Policies and Operations	Milita
		<u>CNO Supp</u>
		CNET
		BUMED
		NAVDAC
		<u>MARCORP</u>
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MENT OF THE NAVYSETS OF COST OBJECTIVES

<u>Command/Claimants</u>	<u>Functional</u>
<u>Planning and Control</u>	<u>Military Operations</u>
ANAV	Sea Control/Projection (Naval- nonstrategic, nonamphibious)
TELCOM	Sea Control/Projection (Aviation)
INTCOM	Sea Projection (Strategic)
SECGRM	Sea Projection (Amphibians)
<u>Procurement - CNM</u>	<u>Support and Mobility</u>
AE	- UNREP
AIR	- Tender/Repair Ships
SEA	- Rescue/Salvage/Tug
FAC	- Intelligence and Information Gathering
ELEX	- Miscellaneous
SUP	<u>Direct Support</u>
O	Ships Repair, Overhaul and Maintenance
<u>Operations</u>	Aircraft Repair and Maintenance
CLANTFLT	Naval Base Support
CPACFLT	Air Base Support
USNAVEUR	Supply Support
VRES	Comand, Control and Communications
<u>Military Personnel</u>	Medical Services
<u>Command</u>	Financial Services
<u>Military Sealift Command</u>	<u>Indirect Support</u>
<u>Support and Services</u>	<u>Recruiting</u>
ST	Training and Education
ED	Facility Acquisition, Improvement and Maintenance
DAC	Research
RP	Procurement
<u>Procurement</u>	Indirect Services
<u>Power</u>	<u>Reserve Forces</u>
<u>erve</u>	<u>Reserve Manpower</u>
<u>erating Forces</u>	Reserve Sea Control/Projection Forces (Naval and Aviation)
V	Reserve Supply Support
<u>erating Forces</u>	Reserve Industrial Support
V	
<u>Procurement - ONR</u>	
<u>ilian Personnel</u>	
COMPT	
<u>ources - I&L</u>	

DEPARTMENT OF NAVY

ILLUSTRATIVE EXPENSE ELEMENT CATEGORIES

Personal Services and Benefits

1. Military Personnel
 - A. Salaries
 1. Assigned to operating forces
 2. Assigned to shore activities
 3. In training status
 4. Other
 - B. Benefits
 1. Quarters
 2. Subsistence and uniforms
 3. FICA taxes
 4. Other, excluding pensions
2. Civilian Personnel
 - A. Full-time personnel
 1. Salaries
 2. Wages
 3. Benefits, excluding pensions
 - B. Part-time personnel
 1. Compensation
 2. Benefits, excluding pensions
3. Pensions, health and life insurance
 - A. Active duty and reserve military personnel
 - B. Active civilian personnel
 - C. Retired and inactive military personnel and survivors
 - D. Retired civilian personnel

Vendor Services and Supplies

4. Travel and transportation of persons
 - A. Change of station
 - B. Other
5. Transportation of things
 - A. Change of station
 - B. Other
6. Communications
7. Utilities
8. Rents
 - A. Land
 - B. Buildings
 - C. Other
9. Printing, reproduction and mailing
10. Purchased maintenance, repair and alternation
 - A. Military hardware
 - B. Support facilities
11. Other services
 - A. Research and development
 - B. Design, engineering and other technical services
 - C. Administrative support services
 - D. Tuition and education
 - E. Storage
 - F. Other
12. Supplies and material
 - A. Ordinance
 - B. Fuel

1. Ships
 2. Aircraft
 3. Other
- C. Repair, alteration and maintenance
- D. Personal care and consumption
 1. Subsistence
 2. Medical
 3. Other
- E. Support facilities
 1. Office
 2. Other
- F. Other
13. Depreciation
 - A. Structures, roads, bridges, etc.
 - B. Military hardware
 1. Ships
 2. Aircraft
 3. Other
 - C. Support equipment
 - D. Furniture, office equipment and other
14. Abandoned Assets
- Grants and Fixed Charges
15. Grants, Subsidies, and Contributions
16. Insurance claims and indemnities
17. Interest and Dividends
18. Refunds

Definitions

The following terms will be used in our discussion of applied costs. The definitions shown are generally consistent with those of the Cost Accounting Standards Board (CASB).

- Cost Objectives --

Programs, organizational subdivisions or other work units for which cost information is desired by management and for which provisions are made to accumulate and measure costs. A final cost objective is the highest summary level and includes both direct and indirect costs.

- Applied costing/cost allocation --

Assigning a cost or group of costs to one or more cost objectives, including directly or through reassignment (allocation) from an indirect cost pool.

- Cost Element --

Classification/subclassification of cost, on the basis of the resource used, e.g. personnel, material, purchased services.

- Cost Classification Principles --

Guidelines for determining the cost element of a particular transaction and the cost objective to which it should be assigned.

- Measurement Principles --

Guidelines for determining the amount at which a particular transaction is to be recorded.

- Primary Cost/Cost Units --

Transactions or summaries of transactions that relate directly to one final cost objective, based upon a beneficial/causal relations.

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APPENDIX 3
PROPERTY ACCOUNTING

PROPERTY ACCOUNTING AND DEPRECIATIONExternal Requirements

GAO and OSD require that all real and personal property costing more than \$300, including military hardware such as ships and aircraft, be capitalized in the financial accounts and accounting records and that the financial accounting system be able to compute and allocate the cost of these assets over their useful lives, through depreciation, in order to accumulate the full costs of programs, projects and organizations.

GAO has recognized that additional research is needed to determine appropriate accounting policies for federal agencies and has specific projects underway in several areas, including fixed asset reporting. In the fixed asset area, GAO is considering different methods of valuing fixed assets.

GAO also plans to undertake a detailed study of depreciation concepts, which could result in methods other than the straight-line method of depreciation being prescribed. GAO requires that procedures be adopted to account for depreciation of capital assets whenever a need arises for a periodic determination of the cost of all resources consumed in performing services.

Capitalization of Property in the Financial Accounts and Records

Most organizations, including many state and local government units, capitalize property in their financial accounts and records and include property information in their financial reports. There are several reasons for this. First, it provides an indication of resources that are available for future operations. Second, capitalizing rather than expensing fixed assets on acquisition more accurately reflects the economic events that occur in the course of operations and makes it possible to report the costs of the assets when they are actually used. Third, it provides greater control over property accounting by providing monetary, as well as unit, controls and by providing a controlled data base of information for planning, budgeting and pricing decisions.

In governmental accounting, some of the reasons for capitalizing property in the financial accounts and records are different than in the private sector, but capitalization is still necessary for the following reasons:

- To provide information about the use and disposition, as well as the acquisition of resources. The stewardship function, which encompasses the safeguarding and maintenance of property and other resources, exists in governments as well as in commercial enterprises. Navy is responsible to DOD, the President, Congress and, ultimately, the public whereas commercial enterprises are responsible to owners. The function, and information

needed to help in the function, are the same. An effective property system requires that asset disposals be reflected in financial records and provides for periodic comparison of the records with actual assets. This not only ensures that property losses and disposals be reported but also provides a monetary measure of losses and disposition of unused capacity.

- Information about asset cost and use is needed for planning, programming, budgeting, and monitoring performance against plans. "Life cycle costing," "operating and support costs," and "ownership cost" are increasingly important concepts in planning and budgeting. These concepts recognize that procurement decisions involve commitments to incur future operating, maintenance and support costs, which may even be more significant than the cost of acquiring an item, and provide that these costs be considered in making procurement decisions. Estimates of life cycle costs for new procurements are based on actual costs associated with similar assets for which there is historical experience. Better information about operating and support costs of existing property can also help in estimating operating and maintenance funds that will be needed to support existing assets during the remainder of their lives.
- Unconsumed assets represent resources that can help in accomplishing future programs. Having these resources available frees up funds that would have to be expended for comparable capacity if they were not available. Good information about these assets can help in timing expenditures to ensure assets can be replaced when needed and that sufficient lead time and funds are available to prevent replacement from being a crisis situation.
- Reimbursable activities must ensure that customer charges include appropriate amounts to cover the value of the property consumed in providing the services. This is especially important in foreign military sales and other programs involving revenues from outside the Federal government.
- The need to match the cost of resources with results seems to be accepted in the Navy and is one of the few tools available for judging operational efficiency when simple measures such as profit cannot be used. For example, pilot training

efficiency might be evaluated on the basis of cost per pilot graduated. Including property costs in such calculations seems to be much less accepted than the overall need to match costs and results. Since property is a significant resource and not very different from many other resources, except that it is used over a longer period of time, it is logical that it be included as part of such costs.

- GAO and OSD require that Navy maintain financial property accounting systems that encompass all fixed assets, including military hardware. Accounting systems that lack information about property are not likely to be approved by the GAO.

The Navy does not presently have financial property systems that cover all of its property. Those systems that do exist are largely decentralized, only used for local purposes and/or are not integrated with other official accounting systems. Navy has also excluded a large portion of its assets from property accounting systems, through selective definition of categories and capitalization thresholds. Perhaps the most significant exclusion involves military hardware, for which financial information appears to be limited and of questionable reliability. Also, the Navy has set a \$1,000 threshold for capitalizing assets, as compared to the GAO threshold of \$300. Since this threshold corresponds to the limit for property acquisition through current appropriations, it is possible to base capitalization decisions on the appropriation that funded the acquisition, regardless of the nature or life of the asset. Therefore, costs of major repairs or renovations

that are funded through current appropriations bypass property accounting, even when they result in extensions of asset life or change in asset nature. The limit for acquiring property through current appropriations is being increased from \$1,000 to \$3,000. Navy must address the impact of this change, as well as the GAO limit of \$300, on its present capitalization policies.

Issues Involving Capitalization of Property

There are several accounting issues that must be resolved before the Navy can integrate property and other financial accounting or reliably determine the cost of such integration.

1. Bases for valuing property

The primary candidates are:

- Unadjusted historical cost.
- Historical cost adjusted for inflation through indexing or other simple means (constant dollar accounting).
- Current market value under normal sale and disposition.
- Replacement cost.
- Economic value.

Unadjusted historical cost is the easiest to determine and most objective. It has enjoyed widespread and long-time acceptance and use in commercial accounting. However, this basis has come under increasing attack because it fails to

reflect, and may even conceal, the impact of inflation, which has a profound impact on long-lived fixed assets.

The carrying value of an item of property accounted for on the basis of unadjusted historical cost may depend as much on when it was acquired as its remaining life or its characteristics, making comparison of the costs of activities or programs with similar assets acquired at different times less meaningful. Historical cost information must be adjusted to current dollars or even estimated future dollars in order to be useful in estimating future costs. The reported cost of resources consumed in a given period consists of a mixture of prices, depending on when the resources were acquired.

Many of the problems associated with unadjusted historical cost accounting can be overcome fairly simply through constant dollar accounting. In this method, values are periodically adjusted for inflation using factors from price level or other predetermined indices. This is one of the present directions in the private sector, where recent pronouncements require that information about the effect of price level changes be reported.

Current market value accounting may not be viable or useful for much of Navy's property, particularly military hardware, because there is no free market from which to determine value of these assets. Prices of property sold to foreign countries may not be a good indication of value because of political factors and the effect of competition from other countries. Current market value also implies an ability or intent to sell, which is seldom present in the Navy.

Replacement cost represents the amount that would have to be paid today to acquire the same capability as that of the asset being valued. While this is an attractive theoretical approach, it can be difficult to apply because available replacement cost information often relates to different assets with similar but not identical capability, rather than reproductions of the asset being valued (which might be of little use, since property is rarely replaced by duplicate copies). Converting the cost of the asset for which

replacement cost information is available to the replacement cost of the asset being valued can be a complex and subjective process. However, this is the overall approach employed when costs of existing assets are used in estimating the cost of new assets. Thus, while replacement cost accounting can be relatively expensive, its use might be appropriate where the resulting information would help avoid duplication of effort in the planning, programming and budgeting area.

Economic value is usually related to the future effect of existing property. That effect includes expenditures that will not be necessary because an asset has already been acquired, expenditures for maintenance, operations and support that will be necessary because an asset has been acquired, and the differences between future expenditures required to support different assets with similar mission capabilities. Such considerations point to the importance of including depreciation in periodic program costs to avoid misleading information.

Most programs consist of a mix of capital assets, which tend to be acquired early in the program, and current resources, which tend to be acquired throughout the program and often increase in later years as capital assets deteriorate. If we assume that the total costs over time, including asset costs, are the same for two programs, failing to include depreciation in periodic program costs would make it appear that a program using more expensive capital assets and less current resources is cheaper when, in fact, that is not the case. For example, nuclear powered vessels are usually more expensive to acquire than conventional vessels and refueling of nuclear vessels is a major effort that occurs only a few times during the vessels' lives. However, those vessels require less oil and propulsion system minor maintenance and, therefore, may be less expensive to operate. Excluding depreciation of vessels and nuclear fuel from periodic program costs could result in information suggesting that conventional vessels are significantly more expensive than nuclear vessels - which would probably be misleading.

2. Guidelines and criteria for capitalizing property

Capitalization criteria cover (i) the amounts that should be capitalized and (ii) the types of costs that should be capitalized.

Establishing a dollar limit or threshold below which items are always charged directly to expense is generally desirable. The purpose of setting a threshold is to achieve a proper balance between the effort required in accounting and the dollar amount being accounted for. In setting a capitalization threshold, consideration should be given to the need to control items that may be below the dollar threshold, but that are pilferable or need to be controlled for other sensitive reasons. The necessary control might be established by reducing the dollar threshold to cover such items, treating them as exceptions to the overall threshold, applying only certain features of property accounting (for example, capitalizing the cost but not depreciating) or providing tighter controls in logistics or other systems.

Some property is acquired and used on a fairly regular and recurring basis, such that charges against operations would be the same whether the items were expensed directly when purchased or were recorded as assets and charged to operations as used. When the value of such assets, like supplies, that may be on hand at any one time is not great, the decision on whether to capitalize should be based on the cost and benefit of greater asset control and the need for information as to the value of assets on hand, rather than the need for accurate financial reporting of costs.

Although the Navy has used a \$1,000 threshold since 1974 as a decision point for capitalization, the GAO has established a \$300 threshold, apparently in response to concern over protecting pilferable items such as typewriters and calculators. OSD has recently changed its policy to be consistent with the GAO's threshold of \$300 except where the services can demonstrate, through cost-benefit analysis, support for a higher threshold. So far, the Navy has not changed to the \$300 threshold, because it believes that such a low threshold cannot be cost justified. However, Navy has not successfully presented justification for a capitalization threshold higher than \$300. GAO has indicated it would probably accept a higher threshold with proper justification. GAO might also accept capitalizing future acquisitions over the \$300 threshold without undertaking the effort to track down and capitalize existing items falling between \$300 and the current Navy threshold of \$1,000.

There are two areas that must be resolved in deciding on the types of costs to be capitalized: repair and maintenance costs and indirect costs associated with initial acquisitions.

In many cases, asset life is dependent upon and may be altered by repairs and maintenance. Original asset productivity declines with age and this decline may accelerate when repairs and maintenance are reduced or postponed. Also, since many assets, particularly weapons systems, are really composed of several components with different lives, repairs may actually be partial replacements or improvements that increase productivity or extend service life.

The close relationship among service life, productivity and repairs is particularly important in the Navy, which annually expends hundreds of millions of dollars to repair and overhaul ships and aircraft. Repairs are also a major factor in estimating system costs in procurement budgeting. Overhauls typically include not only routine maintenance envisioned at the time of acquisition, but also equipment and component replacements and upgrades. For example, in the current overhaul of the aircraft carrier ENTERPRISE (CVN 65), old electronic equipment using vacuum tube technology is being replaced with new solid state electronics.

While existing logistics, maintenance and other management information systems differentiate between routine maintenance and upgrades, property accounting systems, which look principally to the appropriation that funds the repair or overhaul, do not. The cost of items purchased from outside sources with procurement funds can be easily identified and capitalized while costs paid through current appropriations cannot. In neither case is there a differentiation between costs that extend expected life or improve expected productivity (and should, therefore, be considered for capitalization) and routine maintenance costs envisioned at the time of acquisition.

The appropriation through which maintenance is funded can also affect the overall condition of the fleet and can result in expenditures that may not be the best for the Navy. During wartime or other conditions when current appropriation funds may be tight, there can be a tendency to defer

essential maintenance in order to free up current funds for other uses. There may also be a tendency to replace components that could be repaired at lower cost because there are more funds available in procurement, than in current, appropriations.

The importance of repairs, maintenance and conversion to the service life and productivity of property could be reflected through property systems in several ways.

- Separate asset categories and lives can be established for the various components of a weapon system and summarized to determine total value and depreciation of the overall system. Each of the components would be depreciated over its separate expected life and removed from the records at the time of replacement, with the cost of the new component added to the records. Any remaining undepreciated value of components replaced would be expensed at the time of replacement. Routine repairs and maintenance would be expensed as incurred or, if not incurred evenly over the lives of the components, accrued on the basis of estimates. Repairs, maintenance or conversions that extend service life or improve mission capability would be capitalized and depreciated over the remaining service life of the component that they improved.
- An alternative would be to estimate the lifetime of the total system using major repair assumptions, and include the estimated cost of those repairs in the capitalized cost of the asset to be depreciated. Since the anticipated repair costs would be included in the capitalized cost of the asset, the simple straight-line method of depreciation might then be used. Should actual repair costs vary substantially from the estimate, the total cost could be adjusted when the variances were estimated. The initial repair assumption might include upgrades expected during the life of the total system. This method would help focus on variances from initial assumptions about routine maintenance and upgrades.

Each of these methods could result in capitalizing costs that previously were expensed. The first method focuses on individual components and might result in varying charges to expense, depending on the accuracy of predictions about the components. The second method focuses on the total system and

allows the effect of variances from cost predictions to be reflected more evenly over the life of the total systems.

The second principle area to be resolved in deciding what types of costs should be capitalized involves indirect and overhead costs associated with procurement of property. Capitalized cost could include not only the contract price, which is the present Navy practice but also include other costs, even to the extent of costs of personnel involved with the financing, procurement, construction, initial outfitting and shakedown of the property item. Alternatively, capitalized cost could include on-site costs such as inspection and shakedown, but exclude overhead costs such as project management, or capitalized cost could continue to be limited to contract cost.

The decision as to capitalization of ancillary costs depends on overall Navy management decisions as to how costs should be accumulated and applied to final cost objectives. This, in turn, depends on Navy management and decision making factors and procedures. For example, are the procurement functions viewed as a separate task or are they viewed as part of providing a ready fleet in the same sense as routine maintenance? These costs can be very significant in relation to contract price and should be considered in decisions on capitalization guidelines.

3. Guidelines and criteria for
determining property lives

Good accounting practice (as well as GAO requirements) dictate that asset lives correspond to estimated useful economic lifetimes, based on the best available information as to future use. Economic life may be shorter than physical life because of mission changes, technological obsolescence or other factors.

When the Navy buys property, such as a ship, it is really buying a collection of components with varying lifetimes; platform and propulsion plant may last 30 years while weapons and communications gear may last only ten years. A single useful life may be assigned to the total property system, such as the complete ship, or different lives may be assigned to the components making up the total system.

A life determined for the total system would probably be based on the longest lived significant component (i.e. the platform) and replacements of shorter lived components would be added to the original cost to determine the total cost of the system over its life. If accounting were based on the lives of individual components, the cost of replaced components would be deleted and the cost of their replacement added to the cost of the total item to determine the cost of the item as configured at some point in time.

The decision on which method to use should be based on the relative importance of tracking the changes to a total system occurring over its life versus tracking each significant system configuration as a unique asset. Alternatively, information could be provided under both methods. In any case, lives should represent economic lives and should be adjusted when it appears that lives might be different than expected.

Depreciation of Property

The purpose of depreciation is to allocate the cost of acquiring, holding and maintaining assets so as to match cost with task accomplishment. A number of alternatives for depreciation accounting by governments have been proposed, ranging from no depreciation to depreciating all depreciable assets.^{1/}

Arguments for recording depreciation by governments include:^{2/}

^{1/} Anthony, Robert N., Financial Accounting in Non-Business Organizations - An Exploratory Study of Conceptual Issues, Financial Accounting Standards Board, 1978, pp. 137-138.

^{2/} Ibid., pp. 143-144.

- The capitalization of the cost of fixed assets is necessary if government organizations are to have appropriately determined costs of services rendered and an objective operating statement. Capitalization logically requires subsequent amortization for those items having limited life.
- External financial reports (from the viewpoint of operational stewardship) should disclose information about the consumption of fixed assets as well as the application of appropriate resources. Depreciation accounting is the best technique currently available for doing this.
- Where depreciation is to be funded and included as an element of fees to be charged, it is especially important that these charges be tied in to the formal accounting records.
- The use of an operating statement reflecting revenues and expenses does not preclude a simultaneous preparation of the essential statement showing the sources and applications of net appropriable resources.
- Appropriately determined functional costs can provide a sounder basis for budgets and operating plans. This can best be accomplished if depreciation is recorded.
- The capitalization of fixed assets and their subsequent depreciation could help to ensure more useful and complete fixed asset records.
- It is entirely possible that disclosure of accumulated depreciation not recovered in normal revenues and therefore creating an operating deficit could be a supporting factor in soliciting funds for the replacement of fixed assets.

Given a stable price level or appropriate adjustments to compensate for its instability, the distinction between capital and revenue expenditures and the related recording of depreciation can help to disclose the following:

- The fees to be charged where all or a portion of depreciation is to be recovered in such fees;

- The full costs of operations;
- The full costs by functions on a basis that will facilitate inter-entity comparisons;
- The amount of resources available to the entity at a particular instant of time and the changes in those resources over a period of time; and
- The extent of maintenance or erosion of invested capital.

OSD and GAO will probably force a Navy-wide capability to calculate and report depreciation in the near future. However, OSD and GAO stress the "ability" to calculate and report depreciation rather than requiring that depreciation actually be applied in all cases.

Issues Involving Depreciation

There are several accounting issues that should be addressed before the Navy finally decides whether and how to determine and report depreciation.

1. Depreciation methods to be used

Accounting theory says that selection of depreciation methods should reflect consideration of a number of factors, including the following:

- The effect of obsolescence;
- The expected pattern of repairs and maintenance;
- The anticipated decline in operating efficiency;
- The degree of uncertainty regarding the later periods in the asset's life; and
- The relationship between original cost and replacement cost.

Although selection of a depreciation method might be based on all of the above factors, in practice, one or a few factors are likely to dominate. GAO does not specify depreciation methods, but stresses the importance of using simple procedures.

There are four basic types of depreciation methods that might be appropriate:^{3/}

- a. Variable charge methods - Depreciation is based on usage rather than time. Obsolescence is usually not expected to be an important factor and repairs and maintenance costs are expected to be proportional to use. Variable charge methods may provide the most accurate depreciation where use is the biggest determinant of asset life, e.g., for vehicles having a useful life of 100,000 miles. These methods are less useful for assets, such as buildings, where use may not be a primary determinant of asset life.
- b. Straight-line method - Depreciation is recognized evenly over the life of the asset. This is the simplest and most widely used method, but ignores inflation, cost of money, the effect of repairs and maintenance and operating efficiency, all of which are assumed to be constant over the life of the asset. Straight-line methods are simple, objective and usually inexpensive and, therefore, may be the best choice when more complicated methods cannot be justified. OSD currently prescribes use of this depreciation method.
- c. Decreasing charge (accelerated) methods - Less depreciation is recognized in the later years of an asset's life than in the early years. These methods assume a pattern of decreasing productivity and/or increasing repair and maintenance costs over the life of the asset. In some cases, these methods are selected because uncertainty about asset life or productivity calls for the conservative accounting obtained by increasing depreciation charges in the early years and reducing charges in the later, less certain years.

^{3/} Hendrickson, Eldon S., Accounting Theory, Homewood, Ill., Richard D. Irwin, Inc., 1977, pp. 409-421.

- d. Increasing charge methods - More depreciation is recognized in the later years of an asset's life than in the early years. In this case, productivity is assumed to be constant or increasing over the asset life while repair and maintenance expenses are assumed to be constant or decreasing. The increasing charge methods are seldom used and do not appear to be applicable in the Navy.

The relationship between asset life and repairs and maintenance, which was discussed earlier, is an important consideration in selecting depreciation methods. The right method, such as accelerated depreciation where an increasing trend in maintenance costs is expected, can help to better reflect the costs associated with fixed assets in the proper periods.

Technological obsolescence is important in the Navy and, on the surface, might suggest the use of a decreasing charge method of depreciation. Often, however, upgrading for technological improvements is slow and technologically obsolete assets often remain in service because of budget constraints and the long lead times involved in acquiring complex new hardware. Also the Navy often extends the useful lives of assets or replaces assets on a selective basis, such as retaining old platforms and changing specific weapons or other gear. Thus, the use of decreasing charge depreciation methods to allow for obsolescence may not be particularly relevant.

2. Depreciating like assets acquired at different prices

The same property item, such as a particular aircraft, may be acquired in different lots, at different times and prices. If depreciation is calculated separately for each lot or item, problems may arise. First, substantial effort may be necessary to separately account for each specific asset of a particular lot according to the organization having custody of the asset. It may be more practicable to only identify asset types and quantities held by each organization, particularly in the case of comparatively low-cost, homogeneous items. Second, different organizations with like assets, such as F-14 planes, that were procured in different lots at different prices might be charged

with different amounts of depreciation calculated on a specific identification basis, thereby impairing comparison of the organizations. These problems could be resolved by pooling common assets and calculating depreciation on the basis of the pool. This would also simplify property accounting since it would only be necessary to identify quantity and average cost by asset location.

Where should depreciation be recorded and reported?

In many cases, depreciation would not be a controllable cost of the Navy manager holding the asset because he had no voice in its procurement or assignment. Including depreciation charges in his costs may actually reduce the usefulness of cost information to him, although this information may be important in evaluating whether he is properly controlling, maintaining and using the property assigned to him. At higher levels, however, depreciation information may be an important part of cost information used to compare programs or for make or buy decisions. In planning, programming, and budgeting, depreciation information may help in determining life cycle costs of new programs and requirements for continuing to support old programs. Of course, depreciation charges or other measures of property use have long been recognized as necessary to ensure that all costs of foreign military sales and other reimbursable programs are recovered.

and internal requirements for better financial information. The third stage, to be completed by 1990, is to replace the six systems with a standard financial system.

2. Modified FMIP Approach

Alternatively, Navy might combine the first and second stages to incorporate the requirements for better financial information in the original designs of the six systems to the extent possible. That would avoid the need to reprogram the systems to meet compliance after the systems have been installed. Under this alternative, the Navy still might not achieve complete standardization until 1990, but there would be some savings as a result of avoiding separate systems changes for compliance items.

3. Standard System Development Project

A final alternative would be to begin immediately designing a standard system that would incorporate requirements for better financial information and which could be implemented and operational by the mid 1980's. This alternative calls for a direct transition from eleven systems to one system without incurring the costs of developing or changing the six interim systems. As a result, this alternative should be less expensive, providing an effort of this magnitude can be completed efficiently.

Cost Estimates of Alternatives

In estimating the relative costs of the three alternatives, we used Navy's projections for the FMIP, as set forth in the 1981 POM. In that POM, Navy estimated development costs and personnel resources for all of the FMIP projects through 1985, using a financial model. We applied the same methods to extend the costs out through 1989 in order to estimate the full cost (in 1979 dollars) of the FMIP as presently planned.

We estimated that the first alternative would require about 1,700 man-years of effort at a cost of about \$83 million. That would include substantial costs for hardware and for certain individual projects, such as the military pay systems improvement project, whose costs would not be affected by accelerating the development of a standard system. Thus, the illustrative savings that we believe would be possible under alternatives 2 and 3, which are set forth below, are much greater in relation to the parts of the FMIP that would be affected than in relation to the estimated cost of the total FMIP. Also, since these estimates are in 1979 dollars, they tend to understate the savings in current dollars that would result from accelerating some of the projects.

We calculated the cost of the second alternative by adjusting the first alternative's cost estimates to reflect the change in the implementation schedule. We assumed that five FMIP projects would be directly affected by the change in approach:

- 77-3 (Fund Control System)
- 77-4 (Cost System)
- 78-1 (Budget Automation)
- 79-2 (Applied Costs)
- 80-1 (Property Accounting)

On the basis of our experience in designing and installing systems, we estimate that providing for compliance in the original design of the six interim systems (rather

than modifying the systems subsequent to their implementation) could reduce the development costs of the affected projects by as much as 50%. The reduction could result in requirements of approximately 1,500 man-years and \$78 million for the second alternative, or 200 man-years and \$5 million less than the first alternative.

In estimating the costs of the third alternative, we again used the first alternative's estimates, to which we made fairly extensive modifications. We assumed that, although many of the FMIP projects would be replaced by a standard systems development effort, portions of the work outlined in those projects would have to be incorporated in the development effort. Consequently, we reduced the costs of those projects based on our estimates of the project elements that would normally be encompassed in the development of a standard system. That could result in requirements of approximately 1,400 man-years and \$73 million for the third alternative, or 300 man-years and \$10 million less than the first alternative.

Our estimates for each alternative are based on figures from the FY81 POM, which assumes that all projects would be performed in-house. The FY82 POM (which was not available when we prepared these estimates) will reflect different approximations and will include funding for contractor assistance not provided for in the FY81 POM. If the

FY81 POM were adjusted to reflect the cost of contractor assistance and to reflect current dollars, the resulting estimated cost of the present FMIP might be about \$100 million.

Recommended Approach

On the basis of this limited review, we believe that the third alternative is the best approach to achieving financial systems standardization and compliance. Our estimates indicate that this alternative is the least expensive of the three, primarily because it avoids the duplication that would exist in the other alternatives. The third alternative could probably also provide for a standard system in the shortest time frame. Given the continuing scarcity of human and financial resources, this combination of lower cost and shorter time frame probably justifies the risks that might be involved in an effort of this magnitude. However, the scope of our review has been limited and a more detailed analysis, in the form described earlier in this section, should be performed to determine if, in fact, alternative three is the best choice.

The standard financial system would implement "reporting concepts which are logical, feasible, effective and useful in relation to tasks and missions of the Navy." It would also implement accounting policies that have been prescribed by GAO and OSD. Because the standard system

would represent a key "product" of the Navy's Financial Management Improvement Program for the 1980's, we have devoted the remainder of this appendix to describing the major features of the system under the following headings:

- System objectives.
- System overview.
- Functions that the system should perform.
- Current and potential constraints that might limit Navy's ability to achieve the standard system as described.

Objectives

The major objective of a standard financial system is to provide accurate, reliable and timely financial information by processing like transactions in a uniform manner. The design and installation of a standard system throughout the Navy that would accomplish this objective should have the following features and benefits:

- Ensure uniform treatment of transactions and facilitate consistent reporting of financial information.
- Provide maximum flexibility to meet future needs in a timely manner through central ongoing support and coordination.
- Enable cost effective maintenance by requiring only one design and implementation effort for each change or upgrade.
- Facilitate the sharing of financial information among processing centers since all centers would maintain the same data bases with the same systems software.

- Provide maximum base and flexibility in telecommunication through the use of the same or compatible telecommunications equipment and hardware.
- Provide for automated interface - where possible - with other financial and nonfinancial systems which process data relevant to the standard system.

Overview

An effective standard financial system for the Navy should be a modern system that employs state-of-the-art technology throughout the FIPC/CAFO network proposed under IDA. The system should operate in a data base environment. At the FIPC's, the system should support detailed transaction level data bases and, at the CAFO, provide a summary level data base for the entire Navy. The CAFO should also have the capability to extract additional information from the FIPC data bases, as needed. Telecommunications lines between the FIPC's and their customers, the FIPC's and the CAFO and the FIPC's themselves should facilitate on-line data entry, query, update and data transmission. An off-line print capability should be available to those sites with on-line terminals. The standard system should employ compatible hardware and systems software at all processing sites. It should encompass the basic accounting functions required of the FIPC's and the CAFO and be fully integrated with certain existing systems that provide input to financial management processes at the CAFO level (e.g., NIF, NSF, MILPERS, etc.).

Standard System Functions

A standard financial system for the Navy must meet the functional requirements of each of the sixteen FIPC's and the CAFO. The optimal standard system should be modular in design, with a specific module addressing each of the functions required in Navy's financial environment. The systems installed at an individual FIPC should include only those modules needed to meet its particular requirements. Although the systems at an individual FIPC might not include all modules, those that are included should be standard for all FIPC's.

We have identified eight basic modules that might be included in a standard system. These are:

1. General Ledger
2. Budgeting
3. Accounts Payable
4. Accounts Receivable and Sales
5. Contract/Project Administration
6. Inventories
7. Civilian Payroll
8. Management Reporting

These modules and a proposed uniform property system are described in greater detail below. Some of these modules may already exist in present systems and could become

part of the standard system without substantial modification or revision. For example, the PARS system might be a good basis for the contract module and the NAVSCIPS project should result in a standard civilian payroll module.

1. General Ledger

The general ledger module is the core of a financial management system. The chief function of this module is to maintain the general ledger which serves as a record of all financial activity for a given period. The general ledger module validates and processes journal entry transactions and makes the appropriate postings to the ledger.

Some of the specific capabilities of a general ledger module are to:

- Use a standard/uniform chart of accounts incorporating balance sheet and revenue and expense accounts.
- Post accounting transactions on an accrual basis.
- Provide a flexible account coding structure to permit reporting of financial activity by appropriation, organization or other classification.
- Perform dual period processing, i.e. while one period is being closed the next period's transactions can be processed.
- Generate standard journal entries automatically.
- Permit input of one-sided journal entries by automatically creating off-setting entries.
- Make month-end and year-end adjustments automatically.
- Provide variable levels of appropriation control.
- Provide on-line access to appropriation status.
- Apply costs to the appropriate organization (e.g., UIC).

- Maintain both actual and budgeted account balances.
- Provide the financial reports needed by management and the reports needed to provide an adequate audit trail.
 - . Trial Balance
 - . Balance Sheet
 - . Changes in Fund Balances
 - . Fund Control
 - . Audit Trails
 - . Actual vs. Budget for Revenues and Expenses

In a standard financial system for the Navy there should be a general ledger module at two levels. At the FIPC level, the general ledger module should process accounting transactions and maintain general ledgers for the FIPC's customer activities. The FIPC general ledgers should be structured to accommodate primarily the reporting needs of the customer activities, but should also be the primary vehicle for passing information to a CAFO level general ledger module.

At the CAFO level, the general ledger module should maintain a data base of summary level account balances. The CAFO level general ledger module should support both departmental and external Navy reporting requirements. Additionally, this module should provide periodic consolidations of Navy accounting data.

2. Budgeting

A budget module is the mechanism for collecting, accumulating and adjusting yearly budget submissions at all levels. The budget module should provide automated support for budget preparation and revision. Budget data throughout the Navy should be accumulated in this module and summarized according to submission requirements.

Some of the specific capabilities of a budget module are to:

- Budget by period at cost center and summary levels.
- Permit budget revisions on a controlled basis.
- Maintain and report multiple budget versions.

- Support multiple year budgets.
- Budget in both performance units and dollars.
- Extract historical data from the general ledger module to assist in budget preparation.
- Report period and year-to-date budgets.
- Report at detail and summary levels.
- Provide appropriation, organization and program summary reporting.

The budget module should be maintained at the FIPC and CAFO level. The module should pass budget data to the FIPC general ledger module once the final budget is approved and provide the necessary periodic reporting among the CAFO, FIPC's and customer activities.

3. Accounts Payable

An accounts payable module performs all common payables functions including the entry and matching of purchase orders, receipts and invoices. The module should be fully integrated with the general ledger module to ensure that fund balances recorded in the general ledger reflect current expenditure activity. The accounts payable module should be able to support selecting suppliers, monitoring outstanding purchase orders, validating vendors' claims for payment and paying vendors for materials purchased.

Some of the specific features of an accounts payable module are to:

- Produce one payment check for multiple invoices from the same vendor.
- Permit voiding of checks.
- Permit placing of voucher payments in suspense for invoices due payment.
- Permit manual check preparation as required.
- Provide for multiple account distribution to different cost centers and appropriations.
- Provide for rejection of duplicate invoices.

- Permit partial payments on contracts, purchase orders.
- Support cash management policies by maximizing use of vendor discounts and/or holding checks until specified release dates.
- Provide the following reporting on a daily, weekly or on demand basis:
 - . Voucher register
 - . Cash disbursements journal
 - . Check register
 - . Vendor analysis
 - . Cash requirements report
 - . Expenditure report

4. Accounts Receivable

An accounts receivable module processes revenue transactions. It maintains data on monthly collections, current account balances, aging of accounts, past due accounts, and collection histories.

Some of the specific capabilities of this module are to:

- Maintain receivable history for a specified period, such as one fiscal year.
- Age receivables according to Treasury/Navy defined aging criteria.
- Account for bad debts.
- Automatically produce a receipt advice for individual accounts selected by a Navy activity.

5. Contract/Project Administration

The purpose of a contract/project administration module is to monitor and control the monetary flows and the progress-to-date of outstanding contracts and projects. Standard contract administration procedures devised by DOD (MILSCAP) or the PARS system could serve as the basis of this module. This module accumulates both monetary and statistical information to facilitate analysis and supervision of projects throughout their execution. It provides project managers with the capability

of closely monitoring the progress of both internal and external (work performed by outside contractors) Navy projects - from a financial, as well as performance, standpoint.

Some of the specific capabilities of a contract/project administration module are to:

- Establish an obligation when contracts are issued.
- Reject disbursements in excess of remaining contract balance.
- Process change orders.
- Account for and report retainage automatically.
- Transfer balances from one contract to another.
- Maintain and report complete history of contract until contract is deleted.
- Maintain and report comprehensive information for each contractor.

6. Inventory

The standard Navy financial system should also include a module for controlling all inventories at sites other than Navy Supply Centers. This module might be based on or eventually extended to cover Navy Supply Center inventories.

Some of the specific capabilities of an inventory module are to:

- Provide for automatic expediting, generation of purchase orders and monitoring vendor performance.
- Facilitate inventory control, including automatic replenishment of vendor-ordered and transferred items.
- Perform inventory accounting.
- Provide demand forecasting and monitoring techniques, including projected stock-out identification.

- Provide for projected materials planning and control.
- Classify and report stock item description information through an automated catalog.
- Provide the following reporting:
 - . Stock status
 - . Forecasted status
 - . Exception reporting
 - . Management summaries
 - . Open order status
 - . Expedite activity
 - . Vendor activity
 - . Purchase orders
 - . Journal entries (to be passed to the general ledger module)
 - . Transaction registers
 - . Average unit cost variance

7. Civilian Payroll

Navy is currently developing a standard civilian payroll system (NAVSCIPS) that might serve as the civilian payroll module of a standard financial system. The major objective of this module is to process civilian payroll transactions in a timely, efficient and accurate manner.

Key features of this module are to:

- Provide uniform and current update of files for accurate and timely implementation of new pay rates and medical deductions.
- Distribute payroll costs of various programs, projects and organizations.
- Generate appropriate accounting entries to transfer funds.
- Maintain all sick and annual leave records, including automatic accruals.
- Provide for variable deduction frequency and automatic deduction pick up for missed deductions.
- Provide the following reports:

- . Payroll register
- . Pay period control report
- . Deduction register
- . FICA summary (where applicable)
- . W-2
- . Labor distribution
- . Paid leave register
- . Historical earnings
- . Check reconciliation

8. Management Reporting

A management reporting module supports all of the other modules in a standard system. It provides a highly flexible reporting capability that is structured to meet both internal and external reporting requirements. This module should produce standard financial statement reports, financial reports by appropriation, responsibility reports for designated units within the organization, statistical reports by responsibility area, etc. It provides for both standard and user designed reports.

Some of the key features of this module include:

- Organizational responsibility reporting
- Program responsibility reporting
- Project responsibility reporting
- Financial and units-of-service data
- Summary reporting for each higher level of management
- Reporting roll-up structure coded through tables
- Reporting to external parties
- Consolidated reporting
- On-request reporting

Management reporting modules should be located at both the FIPC and the CAFO levels. The FIPC level module should provide the management information required by local managers. The CAFO level module should provide the information for departmental and external management reporting purposes.

Property System

Although envisioned as a separate system, a uniform property system should be closely interfaced with the standard system and could function much like a module of that system. It should interact with the general ledger, budgeting, accounts payable and management reporting modules of the standard system. The proposed property system should be the mechanism for maintaining financial records of all real and personal property, including military hardware.

Some of the specific capabilities of the uniform property system should be to:

- Maintain a fixed asset data base that contains detailed information for each property item including real property, personal property and military hardware:
 - . flexible asset numbering scheme.
 - . depreciable and nondepreciable items included in the data base.
 - . maintain assets in item and group accounts for depreciation purposes.
 - . allow optional data required for repair and maintenance reporting to be included in the data base.
- Provide for posting fixed asset additions, retirements, transfers and adjustments to the data base.
 - . provide for simultaneous automated recording of transfers of assets between locations and between users.
- Provide for computing depreciation automatically.

- . provide alternative depreciation methods.
- . allow computations to be performed on either an item or composite account bases.
- Provide for interface with the standard system to update fixed asset account balances.
- Provide for interface with procurement systems for military hardware information.
- Provide for online inquiry of individual property records in the data base.
- Provide a reporting capability to support users at various organization levels.
- Support DOD reporting of military hardware as well as other external reporting requirements.

Standard System Constraints

Achieving standardization in financial management systems requires major changes in Navy's processing environment. Standardization requires the design, implementation and maintenance of a new uniform processing system, which should be done by a single central design group; however, such a group does not exist today. Installing a uniform system requires standard hardware and systems software. The magnitude of these changes may make it difficult to achieve full standardization through one effort.

The factors that may deter efforts to achieve full standardization include:

- Legal constraints: Legislation governing computer hardware procurement may restrict efforts to obtain uniform equipment. This legislation requires

competitive procurement of hardware and could result in hardware that is not fully compatible with the UNIVAC hardware now being purchased. However, while employing one type of computer hardware for a standard systems environment may be optimal, it is not an absolute requirement. A standard system can run on different equipment as long as the hardware employed is plug compatible. Another alternative - proposed by NAVDAC for the IDA project - is to use mini computers or other devices to interface the various hardware that might be used for the standard system and other systems that should be interfaced with the standard system. Although this option would probably be more costly and less effective than uniform hardware, it is a feasible way of preserving standardization should legal constraints prohibit hardware uniformity.

- Conversion costs: The cost of implementing a new standard system could be sizeable due to the large scale of Navy financial operations, the number of processing activities and the number of nonfinancial systems that might interact with the standard system. However, simplifying the accounting environment and reducing the number of financial processing sites, which is the objective of the IDA project, will provide a more cost effective environment in which to implement a standard system. Similarly, implementing other current system developments with a standard system should reduce the incremental cost of the standard system and should be viewed in that light.
- Interfaces with other systems: A standard financial system for the FIPC/CAFO network will require regular input from, and will provide output to, other financial and nonfinancial systems. It might also share data bases with other systems. The NIF, stock fund, and MILPERS systems all process accounting information that must be posted to the field-level and CAFO general ledgers on a periodic basis. Certain management information systems that support Navy operations generate productivity and performance data that can be used by financial systems for allocation calculations and distributions and for performance cost information.
- Manager reaction: While it is more efficient to centrally design and maintain a standard system, this would reduce the field managers' capability

to direct and control the design of financial systems, which may result in adverse reactions on their part. However, centralization and standardization of system development and maintenance functions will also result in benefits for the field managers. A central design organization should make more efficient use of systems personnel, leaving them with more time to respond to individual manager's requests. Implementation of upgrades and other changes to a standard system only have to be designed once and, thus, can be made on a more timely basis. Standard system development efforts will benefit all financial processing centers and can be shared rather than being limited to the command that originated the effort. Finally, and perhaps most important, there may be no other way of providing Navy managers with accurate and reliable financial information in time to be useful.

It should be noted that system standardization and central systems control need not reduce the field managers' ability to control their data bases or alter system outputs that they regard as useful. The standard systems design can provide for field managers to control reporting from and access to their data bases.

Because of their potential impact on efforts to standardize financial systems, these constraints should be evaluated more thoroughly before a final decision on system development work is made. A more detailed review of the current systems environment might also reveal other constraints that should be considered.

APPENDIX 5
EXISTING PROJECTS

DESCRIPTION OF FINANCIAL IMPROVEMENT PROJECTS
CURRENTLY UNDER WAY AND PLANNED

Projects Under Way

1. Projects 77-1 and 77-2

Projects 77-1 and 77-2 address the need for better integration among programming, budgeting and accounting processes. These projects, along with the current Budget Classification Code Restructure project, represent a sizable effort to reduce the "disconnects" existing in the Navy's financial management systems and to facilitate more effective financial management in general.

The objectives of Project 77-1 are: to document the deficiencies of the current departmental level reporting system (NCIS/FYDP), to identify capabilities required of an improved departmental reporting system and to design and implement the improvements. The main objective of Project 77-2 is to identify a classification structure that will facilitate interfacing programming, budgeting and accounting processes and provide the capability to accumulate and report financial data to support managers' needs.

The problem definition phase of Project 77-1 was completed during fiscal year 1978. During this phase, the 77-1 project team reviewed the major limitations and problems

of current departmental reporting. Responses to a questionnaire distributed to financial managers at headquarters and major claimant levels helped identify a number of gaps between information that is required at departmental levels and information that is actually provided. The project team then documented the major deficiencies and summarized recommendations for improvements in reporting systems. Included in the 77-1 Problem Definition Report were these recommendations:

- Development of an improved departmental level reporting system using the NCIS/FYDP system as the basis.
- Consolidation of overlapping financial data bases (in particular NCIS and NARM) into a centralized information bank which would support programming, budgeting and accounting.
- Automation of the budget process at both the headquarters and the major claimant levels.

Currently, the Program Information Center (DONPIC) is developing high level specifications for redesign of the NCIS/FYDP system and for consolidation of the NCIS and NARM data bases. Another project team in NAFC (Naval Accounting and Finance Center) is reviewing requirements for automating the budget process.

Project 77-2 has been a joint effort between a Navy project team and an outside contractor. The Navy team identified the appropriations and funds through which Navy's money flows. They then analyzed the treatment of eleven

major appropriations through the programming, budgeting and accounting processes, concentrating particularly on duplication and other problems with classification codes. The contractor team then identified and reviewed in detail the existing classification structures in the Navy to determine which codes are obsolete, or rarely used. Finally, the contractor team developed three alternative approaches for modifying the classification structures to facilitate automated "cross-walking" between programming, budgeting and accounting systems. These alternatives were presented in a report issued in September 1979.

This report is being circulated among financial managers at headquarters and major claimant levels for review and approval. Concurrently, a NAFC team is attempting to determine the cost impact of each of the alternatives presented.

2. Integrated Disbursing and Accounting (IDA)

The IDA project was initiated to undertake a major restructuring of Navy's financial management environment. IDA's objective is to achieve greater accuracy and timeliness in the reporting of financial data by integrating Navy's accounting and disbursing functions.

Under IDA, accounting and disbursing activities (AAA's and NRFC's, respectively) will be combined and

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consolidated into a network of sixteen regional Financial Information Processing Centers (FIPC's). Each FIPC will maintain a financial data base and will provide a full range of data processing and reporting services to its customer activities. FIPC's will also report summary information to a central data base, maintained by a Central Accounting and Finance Office (CAFO), that will facilitate headquarters level reporting. Teleprocessing will link FIPC's with their customer activities, with each other and with the CAFO to ensure the availability of timely financial information at all management levels.

IDA is envisioned as a three-phase project. Phase I provides for the initial integration of disbursing and accounting through data exchanges between the FIPC's and the NRFC's. Phase II provides for online access by customer activities and for an integrated accounting and disbursing data base. Phase III provides for a telecommunications network linking the FIPC/CAFO network.

Navy's current plan is for IDA to be fully operational by fiscal year 1984. As explained earlier in this report, a significant change in the IDA project to use one existing system at a majority of the FIPCs is being considered. This change is expected to help achieve timely implementation of Phases I and II, but could defer full implementation of Phase III of the project.

3. Navy Standard Civilian Payroll System (NAVSCIPS)

The objective of the NAVSCIPS project is to provide a single standard system for processing all Navy civilian payroll transactions. The new system will replace seven existing civilian payroll systems in the continental U.S. and Hawaii.

NAVSCIPS was undertaken in response to a directive from DOD to design and implement a standard system to enhance productivity and reduce support costs in handling civilian payrolls. Successful completion of the NAVSCIPS project is expected to achieve both of these requirements. Specifically, the project is to:

- Design one standard ADP civilian payroll system using "state-of-the-art" data processing technology.
- Reduce Central Design Authority (CDA) systems maintenance costs.
- Consolidate civilian payroll offices.
- Reduce duplicate data entry and maintenance.
- Reduce the number of hard copy internal documents through the use of CRTs, etc.
- Allow for future integration of payroll and personnel data bases.

Implementation of NAVSCIPS will also provide uniformity in the processing of all civilian payroll transactions.

4. Naval Industrial Fund Laboratories (NIFLABS)

The NIFLABS project team began a study in 1977 to determine the feasibility of employing a standard financial system at thirteen NIF RDT&E activities. As a result of this feasibility study, design of a single, uniform financial system that would ultimately replace the various systems now in existence at the NIFLAB activities was authorized. The new system, which is being designed to comply with GAO Title II requirements, will be a modern data base system supporting on-line input, query and update and one-time data capture. Current plans are for the system to be fully developed and operational at all NIFLABS by the end of fiscal year 1982.

NIFLABS is a major advance towards standardization of financial systems that will provide for greater efficiency, timeliness and, most importantly, uniformity in the handling of NIF RDT&E transactions. However, the scope of this project is limited to the thirteen NIF RDT&E activities - it does not address other parts of the accounting system.

5. Military Standard Contract Administration Procedures (MILSCAP)

The MILSCAP program is an effort initiated by DOD in 1966 to achieve standardization in processing DOD contract related data. MILSCAP prescribes procedures, forms and codes to be employed in accounting for defense contracts. Although MILSCAP was originally intended for use throughout DOD,

implementation has been limited to a current effort by the Defense Logistics Agency to adopt portions of the prescribed system.

There is increasing pressure from DOD and GAO for the military services to implement MILSCAP. Implementation could require significant changes in the Navy's procurement accounting systems. Also, a recent directive from DOD calls for the design of an automated interface between DCASR's and the services' accounting systems in order to provide daily accrued expenditure data to the accounting activities originally recording a contract. Such an automated interface would necessitate changes in Navy's accounting systems and chart of accounts to accommodate this accrual data.

6. DOD Uniform General Ledger Accounts (UGLA)

DOD is developing a uniform chart of accounts (UGLA) for use by all DOD components. UGLA is expected to eventually replace Navy's present general ledger structure and other accounts used in existing appropriation, fund and financial accounting systems. DOD believes UGLA will:

- Integrate current systems while maintaining the ability to generate all currently available information, particularly fund and appropriation status.
- Provide better control over the acquisition and disposition of assets.

- Enable DOD components to generate cost information at all organizational levels for better management control.

Although UGLA is still in a formative state, its potential impact on the Navy will be significant. This impact has been discussed earlier in the report.

7. Naval Data Automation Command (NAVDAC)

NAVDAC's \$150 million contractual authority will result in replacing specified hardware equipment with upgraded UNIVAC equipment at many of the processing centers that support Naval financial management systems. Within the next two years, AUTODIN II, a high-speed telecommunications network, is also expected to be in place. NAVDAC then plans to link the UNIVAC equipment directly with the communications network and plans to use Interdata 732 mini-computers to interface NAVSUP Burroughs equipment with AUTODIN II.

Projects Programmed, Not Yet Under Way

1. 77-3 Fund Management System

This project calls for reviewing and revising the Navy's appropriation and fund control systems to assure that the process of subdividing appropriations and funds into allotments is efficient and appropriate. This project is to investigate the trade-offs between strong fund control

(Section 3679 R.S. - "Antideficiency Act" - calls for subdivisions of fund authorizations at the highest practical level) and the present highly specific allotment structure. Project 77-3 is to determine the optimal number of allotments and identify the optimal mechanisms for allotment accounting. This project is scheduled to be completed by September 1985.

2. 77-4 Cost System

This project calls for investigating and documenting financial managers' needs for specific cost and performance data and designing and implementing enhancements to current financial management systems that will provide the required information. The project is to address the failure of current systems to support planning, programming and budgeting processes with relevant cost and quantitative data. Currently, cost data is not accumulated in the same way that programming and budgeting data is prepared, making comparisons between the data difficult. Also, many present accounting systems do not report quantitative data necessary for output measurement and performance evaluation. Project 77-4 is scheduled to be completed by September 1985.

3. 77-5 Processing Afloat Transactions

This project calls for significant improvements in the timeliness and effectiveness of accounting for afloat

units. The project is to address, in particular, the need for improvement in ship-to-shore communications. The ultimate goal is to design and implement a real-time financial management system for afloat units that will use a worldwide telecommunications network to permit the automatic flow of financial data to shore accounting activities. Project definition is scheduled to begin in 1981 and design and implementation is scheduled to be completed by September 1985.

4. 78-1 Automated Budget System

This project calls for reviewing current manual budgeting procedures and designing and implementing new, automated budgeting processes for each appropriation. The project is to address the increasingly important need for a more sophisticated budgeting system. Navy must be able to project the effects of inflation, cuts or changes and other factors on its budgets within a short time period, which is not possible with present manual budgeting procedures. The project is to review the budget process - appropriation by appropriation - and to design and implement automated procedures for this process. Project 78-1 is scheduled to be completed by September 1983.

5. 78-2 Transactions Ashore

This project calls for a financial management system for ashore transactions that will facilitate meeting all reporting requirements within five days after the period cut-off. The emphasis is to be on investigating modern data processing techniques that will permit more efficient and timely entry and transmission of accounting data. The project will also investigate the possibility of automating the programming and budgeting processes. Project definition is scheduled to commence in 1982 and the project is scheduled to be completed in 1987.

6. 79-2 Applied Cost

This project calls for implementing accrual accounting in Navy financial management systems. Although accounting on an accrual basis is a GAO requirement, present Navy accounting systems do not consistently recognize revenues and expenses on the accrual basis. Project 79-2 is to analyze Navy's accounting systems, identify discrepancies in accrual accounting practices and design and implement changes that will eliminate these discrepancies. Project 79-2 is scheduled to be completed by September 1987.

7. 79-3, 79-4, 79-5 Financial Management System Area Improvements

These projects call for improving financial management systems in the Navy through a higher degree of system standardization and centralization. The projects are to investigate and analyze systems improvements required in the areas of operations, investments and research and development. The start and completion dates for these projects have not yet been determined.

8. 80-1 Property Systems

This project calls for enhancing current property systems to include both financial and quantitative information on all real and personal property. We assume that this project would also cover accounting for depreciation of property. The project is scheduled for completion by 1988.

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